Chemical Week

August 2, 1952

Price 35 cents

These chemical labor tycoons vie in inter-union battle for top spot in top industries . . . . . p. 14

CW Report: phosphorus—shifting, growing, changing; here's what's ahead . . . . . p. 26

Trouble looms as states draft individual, conflicting labeling regulations . . . . . p. 44

Celanese's KixMiller and MacFarland: their job is to help a war baby grow . . . . . p. 49

Now "cold" rubber can be made "hot"; the key: a new chemical catalyst . . . . . p. 61

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At the schoolground or in the stratosphere, flying takes fuel... whether it's only a thimbleful for a model or a tanker load for a Stratojet. Despite the difference in fuels, both may have come from the same oil well. Transforming crude into such varied types of fuel is a miracle worked by the petroleum industry... with an assist from chemistry.

Closely associated with the petroleum industry, Mathieson—now in its 60th year as one of America's major chemical companies—today supplies petroleum processors with more basic chemicals than ever before... such products as caustic soda, ammonia, sodium chlorite, sulphuric acid, diethylene glycol, triethylene glycol, dichloroethylether.

A dependable source of supply for essential raw materials is always important. If your production requires any of these chemicals, you may be able to buy *to better advantage* by consulting with us now. Mathieson Chemical Corporation, Baltimore 3, Maryland.

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SERVING INDUSTRY, AGRICULTURE AND PUBLIC HEALTH

Chemical Week

Volume 71 Number 5

August 2, 1952

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OPINION....

Spiked Water

TO THE EDITOR: Attorney Krause's anti-fluoridation suit, reported in CW, June 28, reminded me of an important legal controversy which might have occurred many years ago. A taxpayer's suit could have been filed to prohibit municipalities from the socialistic practice of chlorinating water, because the city's next step might be to spike the drinking water with fluorine to prevent tooth decay.

Your reporting of the fluoridation problem has been excellent. Let's hear more about Mr. Krause's suit when it happens.

LEO S. LUSKIN
Rohm & Haas Co.
Philadelphia, Pa.

Communications Plus

TO THE EDITOR: I was very much interested to read your article "Communications Plus" (*May 31*) [which described a pneumatic tube system installed in the new Kalamazoo, Mich. plant of Upjohn to transport samples, mail, etc., around the 33-acre unit]...

Only the day previously I had seen demonstrated, at the Mechanical Handling Exhibition, a pneumatic tube system *requiring only one tube and no central office.*

Apparently, each container has a small number of fingers which can be pre-set to the code number of the receiving station, resulting in the container's being ejected from the tube at that station and no other.

Altogether I found it very ingenious and I should be pleased to send further information to any of your readers who may be interested. . . .

J. C. WILLIAMS
203 Albany St.
London, N. W. 1, Eng.

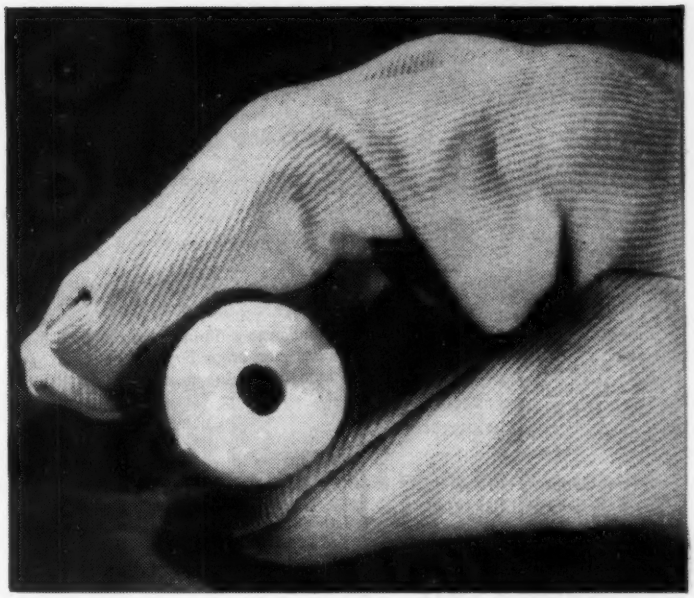
Clearing Misconceptions

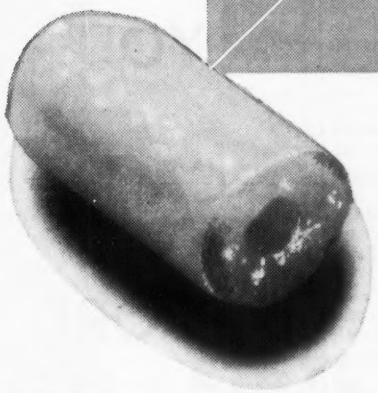
TO THE EDITOR: I don't often do this, but I want to take a few minutes out to tell you what an excellent job I think you did on a very complex subject in your cryolite news article "Plea for Cryolite" (July 19). . . .

You were, I know, bombarded with conflicting information and opinion from at least three quarters. . . . I am impressed by the way you brought it together in a presentation that was, to the best of our knowledge, fair, impartial and accurate.

I think the biggest advantage of your story, and one which will make a real impact on the industry, is that it has cleared up most of the misconceptions arising from not so care-

the picture tells the story





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These hollow rods are exactly what you need when you use Maleic Anhydride. They have been engineered to give you:

- Maximum Surface Area
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- A Minimum of "Dusting"
- High Purity . . . 99% by weight Maleic Anhydride, min.

You can cut costs using CARBIDE's hollow-rod Maleic Anhydride. No waste in handling, and it melts or dissolves readily. This form of Maleic Anhydride saves time and labor and makes for better working conditions.

For data on CARBIDE's Maleic Anhydride, ask for this 8-page booklet, F-7317. Did you know that CARBIDE also produces a variety of maleic derivatives? For more technical information on them, ask for technical bulletin F-7354.

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Carbide and Carbon Chemicals, Limited, Toronto

ful reporting in some other publications.

For this reason alone I think that all concerned have reason to be grateful to CW. . . .

CLEVELAND LANE
Pennsylvania Salt Manufacturing Co.
Philadelphia, Pa.

Drifting Hormones

TO THE EDITOR: I read with great interest your report of "Herbicide Strays" (July 12) [which described damage to a 58-mile strip of highway-bordering crops by a herbicide of unknown origin—possibly blown from a transporting truck]. The damage you describe along Highway 81 started at Hillsboro, Texas (62 miles south of Dallas) and extends south to Troy, Texas.

In this connection, I am sure that the enclosed clipping from the *Dallas Morning News* (July 13) will be of interest . . . it describes a similar damage to the cotton crop over a much larger area north of Dallas.

Prosper, Collin County, mentioned in this article, is 12 miles west of McKinney on Highway 24 and is 30 miles north of Dallas. Greenville is 41 miles east of Prosper.

The territory described is practically a right triangle with the apex in Dallas and the right angle at Prosper . . . its area is about 615 square miles . . .

ALFRED ZIMMERN
Consultant
Dallas, Texas

Many thanks, Reader Zimmern. The report says:

- *Thousands of acres of fruiting cotton north of Dallas are dying from the blight of a mysterious chemical floating from the direction of Dallas.*
- *Damage runs from 10% to 100%.*
- *There are lots of theories as to the source of the chemical, few facts. Two theories: Drift of a brush-killing chemical or (possibly but not probably) fumes from a chemical plant. A hope: heavy rain may abate the worries.*
- *One result is that the Texas Dept. of Agriculture is contemplating the "strengthening" of laws governing the use of herbicides.*—ED.

Multi-Laminate News

TO THE EDITOR: . . .Your news article "Mandate for Laminate" (June 28) . . . refers to the use of aluminum foil-laminated kraft in the construction of fiber drums by the Pacific Steelfiber Drums . . . states that this is one of the newest ideas in the field of one-trip containers . . .

For many years the Fiber Drum Di-

among other products sold under "ETHYL" trade-mark: antiknock compounds, benzene hexachloride (technical), ethyl chloride, hydropolymer oil, salt cake.

OPINION . . . . . .

vision, Continental Can Co., has constructed fiber drums having aluminum foil-laminated kraft. In addition, many other films or laminates have been employed depending upon chemical resistance required, degree of moisture vapor permeability, etc.

While no drum to our knowledge has been constructed in which all plies of kraft have had foil laminated to them, the basic idea of a foil barrier is certainly not new. Further, with all plies having foil laminate, it is doubtful if the economics of the fiber drum would be attractive.

In view of this, I am wondering if prior to the writing of the article any survey was made . . . of other drum manufacturers.

P. P. KENNEDY
Engineering Service Division
E. I. Du Pont de Nemours & Co., Inc.,
Wilmington, Del.

Thanks, Reader Kennedy, for your opinions. You are in one respect right.

As you say, the basic idea of utilizing aluminum-kraft and similar laminates is not new; but the 12-ply lamination, the stepped up activities of the West Coast container manufacturer, and its contemplated establishment of a plant in the East, is. Too, the new drums, as we reported, are not designed to compete price-wise or use-wise with straight fiber products; rather they will compete with sheet steel drums.

As CW also said, these new drums are pointed at the petroleum and paint markets because of their unique—for fiber—leak-proof characteristics.—ED.

"Resources for Freedom"

TO THE EDITOR: . . . You have done a fine job in your CW Report (July 5) on the President's Materials Policy Commission. . . .

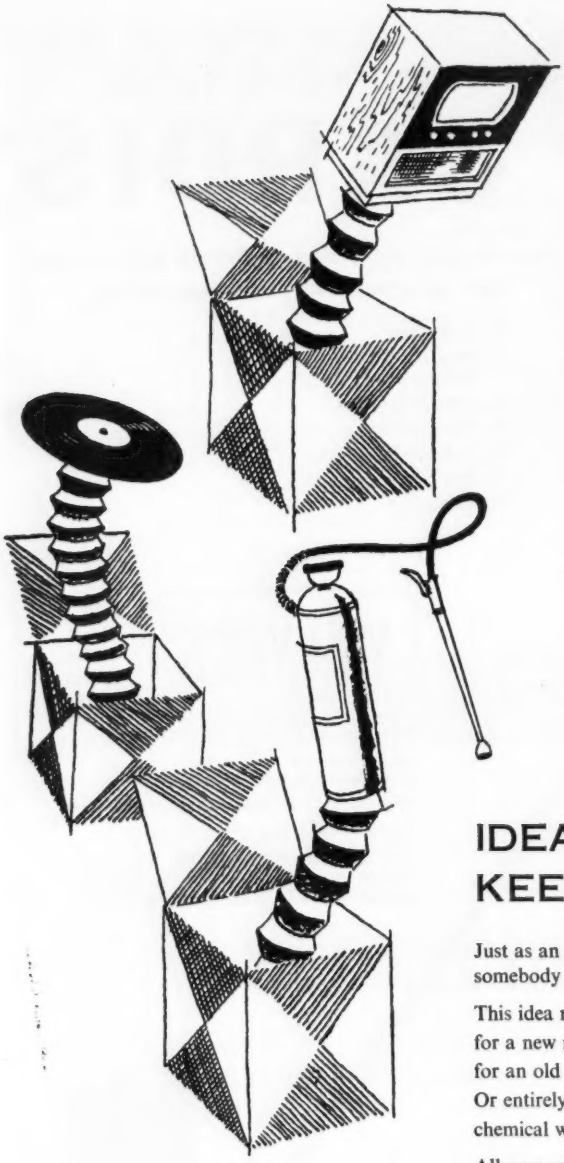
How do we go about obtaining copies of the entire original report. . . .

C. RICHARD HOCKER
C. Richard Hocker Co.
Basking Ridge, N. J.

The five-volume report, "Resources for Freedom," is obtainable from the Superintendent of Documents, Washington 25, D. C. Price: $6.25 total.—ED.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.



This advertisement is one of a series currently appearing in *Wall Street Journal, New York Journal of Commerce* and *Fortune*. The series aims to point out to the investing public and to management that, as the economy grows, so grows the chemical industry. And that as the industry grows, so do its potentialities for profitable investment.

IDEAS KEEP POPPING UP

Just as an industry seems developed to its optimum, somebody sparks a new idea.

This idea may suggest established materials like glass and metal for a new market—television. Or a new material for an old market—plastic recordings. Or entirely new materials for a brand-new market—chemical weed and insect killers.

All new products mean more and more business to DIAMOND ALKALI. Everything is manufactured to some extent from either organic or inorganic chemicals, and DIAMOND makes both.

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Chemicals you live by

DIAMOND ALKALI CHEMICALS

Chemical Week

BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

With Congress out of session, and politics in the headlines, don't believe that nothing is happening on Capitol Hill.

Witness, for example, the subcommittee under Senator Smith (N.C.), which was to investigate the Office of Alien Property. It hasn't had many headlines since Senator Alexander Wiley made his original charges that OAP was a "super gravy train." Nevertheless, committee investigators are hard at work examining files from the OAP office.

The present "steering" staff of three lawyers and an investigator are checking facts which possibly could make Republican campaign hay: Are OAP interests in seized firms (e.g., General Aniline) being liquidated fast enough, or are companies being held as political plums? Is governmental operation of the various enterprises up to snuff?

Several members of the subcommittee plan overseas trips this and next month, but there is a chance that committee hearings may begin in October. It's a sure bet that Republican subcommittee members wouldn't be too sorry if mink coats and Deep Freezes get back into the headlines just before Nov. 4.

Reconstruction Finance Corp., summarizing last week's loan activities, reports two chemical process industry loans: San Manuel Copper Corp. (Superior, Ariz.) received a loan for $94 million; Vitro Chemical Co. (Pittsburgh, Pa.) received $850,000. Both loans were for defense-supporting activities.

Food and Drug Administration probably will not appeal a Federal District Court decision apparently approving the use of saccharin in a soft drink base.

Federal Judge Frank Picard ruled, in Columbus, Ohio, that since no formal standard was set for soft drink bases, the use of saccharin *per se* is not illegal.

But on the other hand, he ruled that an FDA seizure of the material in question (Quenchies, made by the Wafer-Fizz Corp.) was legal since the material was misbranded: The label stated that saccharin was contained, but this was printed in smaller type. If the word had been in equal-size letters, the Judge apparently would have approved saccharin use.

FDA apparently believes that this decision will not set a precedent if a similar case involving use of the sweetener comes up again.

Following the Delaney Committee's rapping of federal government advocacy of water fluoridation, the Food and Drug Administration has expounded its views on a related subject.

The agency doesn't feel that fluoridated public water supplies themselves come within its bailiwick, at least as long as the water has been treated in accordance with USPHS instructions. For food products where, through evaporation or concentration, the fluoride percentage may be higher, "the facts with respect to the particular case" will be the criterion.

Now that the steel strike which nobody won has been settled, producers and users of coal tar chemicals are wondering how the new wage pattern will affect these materials. Bargaining agent for many of these plants is the same CIO Steelworkers union.

Price rises on specialty steels will be based on that for carbon steel, but it hasn't been determined yet whether the same general policy will apply to coal by-products.

For those firms which process coal tar under contract and are not organized by the Steelworkers, price relief—if any—would likely be obtainable only by the "industry earnings standard" (where relief is granted if pre-tax profits are less than 85% of those in the base period).

Although a deal for Canadian aluminum still isn't likely, DPA was urged last week by Rep. Emanuel Celler (D., N.Y.), chairman of the House Judiciary Committee, to ignore opposition by the Joint Committee on Defense Production and go ahead with the Alcan deal.

DPA administrator Fowler tends to go along with Celler, but he's not likely to overrule the Joint Committee's recommendations.

Celler got into the act because of monopoly implications. Two years ago he opposed an Alcan proposal on grounds that it was a monopoly. urged expansion of domestic production. Now he says domestic production has been too little and too late, and the Alcan deal is the only reliable means of getting more of the strategic metal.

There's joy this week among Texas gas producers. Last Saturday District Judge Jack Roberts declared unconstitutional the natural gas gathering tax that went into effect less than a year ago.

The Judge found that the tax was a burden on interstate commerce and therefore unconstitutional, but the State is certain to appeal his ruling.

"Zest" electrified the soap and synthetic detergent industry this week. Monday morning Procter & Gamble salesmen started selling the new, all-synthetic bar soap in Cincinnati—the first large-scale retail marketing test.

Composition of the new bar is a closely guarded P & G secret. What the company will say: Price will be about 60% higher than Camay and comparable soaps, but it will last maybe 40% longer. Biggest selling point: no "bathtub ring."

Titanium is sharply in the news this week. The government is lending Du Pont $14.7 million to expand output of titanium sponge. The firm will turn out 13,500 tons over a five-year period and will repay the loan with interest. Defense Materials Procurement Agency says Du Pont's capacity will have to be tripled. That indicates a current capacity of 900 tons a year, future capacity of 2,700 tons.

Union Carbide has signed an agreement with Horizons Titanium whereby UCC gets non-exclusive rights to the latter's process. Nothing immediate is in sight. "When we'll enter the titanium business is anybody's guess," says Union Carbide.

Dow has been pilot-planting its own, non-Kroll process. The company is mum on location, size, raw materials. A logical possibility: Its know-how in magnesium and chlorination points to electrolytic reduction of titanium tetrachloride.

. . . The Editors

How porous *do you want your* catalyst supports?

Norton catalyst supports come in two types:

1. If your process calls for coated catalyst supports, you get what you want from Norton medium-porosity spheres. They have a porosity of 30-35%, with a rough, open surface structure. This gives you maximum adherence of catalyst to surface.

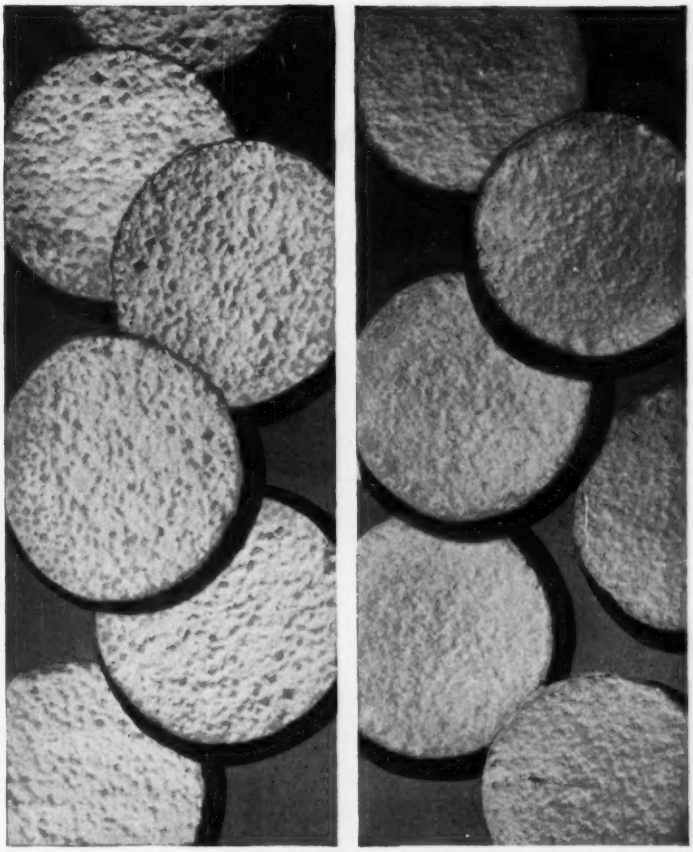
2. If you need supports for impregnation, Norton high-porosity spheres are your choice. Their porosity is 42-47% with large, connected, internal pores uniformly dispersed throughout the support. This gives you maximum deposition of catalyst.

You also have a choice of sizes and shapes. Norton spheres are available in diameters of ⅛" to 1". Other Norton catalyst supports, in ring and pellet form, available in diameters of ⅛" to 2".

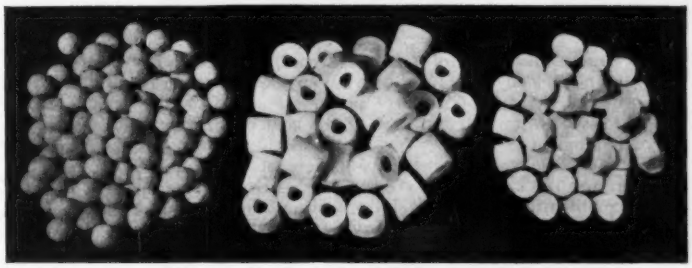
A choice of materials, too. Norton catalyst supports can be made from a variety of refractory materials, offering many different combinations of properties.

Test them in action

You can easily prove, in your own plant, what Norton catalyst supports can do towards improving your production. Want to see samples? Contact your Norton representative or write direct to Norton Company, 247 New Bond Street, Worcester 6, Mass. *Canadian Representative:* A. P. Green Fire Brick Co., Ltd., Toronto, Ont.



Greatly enlarged views of cross-sections of the two types of Norton catalyst support spheres. *Left: Norton High-Porosity Spheres* have connected pores throughout. *Right: Norton Medium-Porosity Spheres* have pores close to surface. You can also get Norton Low-Porosity Spheres if required.



Norton catalyst supports are made in sphere, ring, and pellet form.

NORTON HEAT EXCHANGE PEBBLES also offer you worthwhile advantages, especially where alternating oxidizing and reducing atmospheres are met. They're made of ALUNDUM* electrically fused alumina (alumina content 95% to 99%). Nothing like them for static or moving heat exchange beds.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

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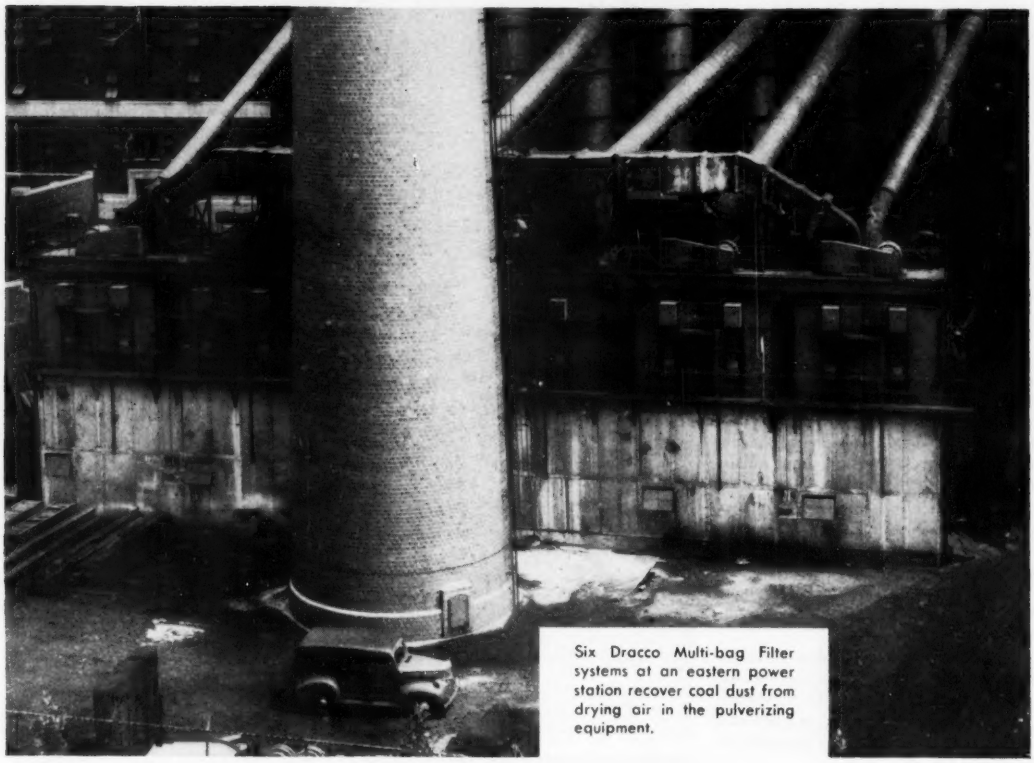


Six Dracco Multi-bag Filter systems at an eastern power station recover coal dust from drying air in the pulverizing equipment.

Dracco Dust Control Equipment contributes to the high-efficiency operation of a major eastern public utility. At one of its large power stations Dracco Filters are an integral part of the coal pulverizing equipment.

To feed the high-capacity boilers at maximum rating 180 tons of coal are processed each hour in a combination grinding-drying operation. The air blast which removes moisture from the coal must be filtered to recover entrained coal dust. Dracco Equipment handles *180,000 cubic feet of air each minute* and reclaims an estimated *one to two tons* of coal every hour.

The efficient, cost-saving performance of this Dracco Dust Control installation is typical of the Dracco contribution to industrial efficiency. Whether your dust problem is large or small, you can profit from Dracco experience and skilled engineering.

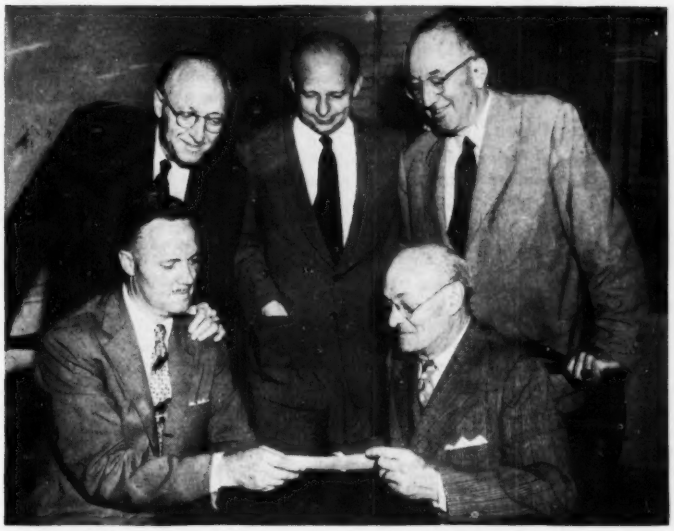
DRACCO CORPORATION

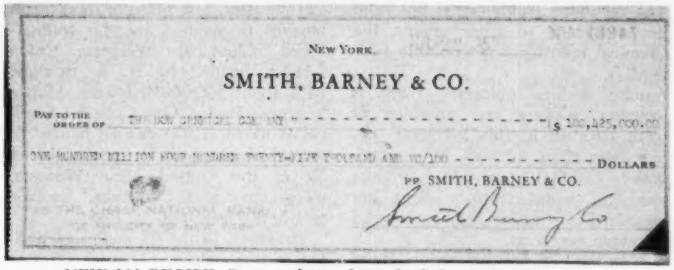
Harvard Ave. and East 116th St. · Cleveland 5, Ohio

Consult your nearest Dracco representative or write Dept. W-8, Cleveland 5, Ohio, for specific information on Dracco Equipment.

DRACCO *Performance Proved*

Airstream **CONVEYORS · DUST CONTROL EQUIPMENT**





NEW $$$ RECIPE: Dow pockets robust check for junior debentures.†

Quick Cash for Fast Growth

"Your letter containing draft for $75 just received. I think that will give us enough funds to last for quite a while."*

That note suggests the financial struggles of the late Herbert H. Dow, founder of Dow Chemical Co., when he was starting in business more than 50 years ago. This week, Dow's company pockets a loan of $100,425,000—and the whole industry has been asking, How long will these funds last for fast-growing Dow?

New Debenture Record: This new money makes a total of around one-quarter billion dollars that Dow has borrowed within the past 12 months to help pay for expansion projects over the next four years. After that, Dow hopes its retained earnings and depreciation set-aside will provide $100 million each year for expansion.

Latest chunk of cash-on-the-cuff for Dow growth is coming (directly) from 233 underwriters headed by Smith, Barney & Co., who in turn are offering the 3% debentures to their own dealers and customers. These debentures are junior to all present and future company debt; there is a substantial saving on interest and tax rates on this kind of bonds. The debentures may be exchanged for common stock over a 30-year schedule.

According to Charles W. Kennard, of Smith, Barney & Co., who has been planning Dow financing since 1935, this is the largest single offering of subordinate debentures on record. In the past, he noted, such debentures had a certain "smell" in financial circles because they were used by shaky companies in reorganization and recapitalization.

Now In Fashion: But now that companies with top financial standing are using junior debentures, this system of money-raising is likely to become more popular among growing industrial firms, Kennard foresees. He notes that several months ago, Union Oil of California got $35 million this way.

Dow now holds certificates of necessity for a total of $301 million worth of new plant construction at 54% average net write-off, of which projects work already is under way on jobs valued at $145 million.

About half of all expansion is planned for Texas, mostly near the two present plants at Freeport, on the Gulf Coast 65 miles south from Houston. The existing plants are six miles apart, and some Dow people are looking forward to a day when those six miles will be covered with more Dow plants.

Constant Expansion: "At Dow, we never stop building," Chairman of the Board Earl Bennett remarked in accepting the check from Kennard. "We build in boom times to keep up with demand; we build in slump times for the future."

History bears out Bennett's nutshell summation of Dow's philosophy of expansion. The company has grown to present stature (total assets at end of fiscal 1951: $427,180,839) almost entirely by building new plants and founding new divisions; only rarely has Dow increased its corporate girth by buying up other firms.

In a number of products, Dow's repertory has swelled from a meager three (chlorine, bromine and bleaching powder) in 1900 to about 600 now, with even greater diversity planned.

No Regrets: Chemical markets have softened in recent months, but President Leland I. Doan says Dow is glad it has all its present plants, and sees no reason to cut down on expansion planning.

Dow views the long-range outlook for the chemical industry "with great optimism," Doan says, and looks to new developments in synthetic fibers (e.g., Saran fine fibers) and plastics (especially Styron, latices and plas-

* Letter from Herbert H. Dow to B. H. Howe, April, 1891. (From "Herbert H. Dow: Pioneer in Creative Chemistry," p. 23.)

† Handing over the check is Charles W. Kennard, left, of Smith, Barney & Co., with Dow Chairman Bennett on the receiving end. Looking on are Dow officers Calvin A. Campbell, vice-president and general counsel; Carl A. Gerstacker, treasurer; and President Doan.

ticizers) as foundations for future business growth. Research is being pushed on ethylene, propylene and their derivatives.

Last year, however, industrial chemicals accounted for approximately 52% of sales volume, with plastics in second place at 29%. Other major items in this breakdown: magnesium, 11%; agricultural chemicals, 5%; and fine chemicals, 3%.

Now with Dow moving rapidly to increase its annual production capacity well above the present rate of about $475 million, the industry will be watching to see who'll be next to grab this new, fast-working method of expanding faster than competitors.

More Important . . .

All living ex-presidents of Du Pont except one gathered two weeks ago to pay tribute to their living monument, their 150-year-old firm. The ill absentee, 71-year-old Lammot du Pont, died just six days later.

The years of his tenure, 1926 to 1940, were stormy ones. Setting his face against the easy counsel of cutting "unnecesary" expenditures during the black depression years, he said, "It is more important to do research than to pay dividends." Later years saw soaring profits from new research-born products, proved the wisdom of his course.

On a par with his enthusiasm for research was his passion for safety.* Statistically speaking, many Du Pont workers are alive today only because of the practices he instituted and insisted upon.

Many men win esteem for achievements during their lifetime; more important are the enduring accomplishments of a few. New products born of research, lives spared by the practice of safety—these remain to mark the leadership of Lammot du Pont.

LABOR . . . . . .

Strike Emasculated: A temporary injunction has weakened the effectiveness of the strike by 1,600 production workers at the Merck plant in Rahway, N. J. The court order restrains the union from mass picketing to keep vehicles from going through the gates. A company spokesman says that this is enabling the company to keep right on filling orders for its products.

He said the drivers are willing to cross the picket lines because the AFL Teamsters don't recognize this strike by the Independent Employes Organization, Inc.

* Stemming in part from the fact that when he was three years old, his father was killed in a dynamite explosion.

EMPLOYEES UNDER 71 SURVEYED CONTRACTS

Union	No. of Contracts	No. of Employes	Percent
Dist. 50, United Mine Workers (Ind.)	13	17,943*	37.0
International Chemical Workers Union (AFL)	17	9,631**	19.8
United Gas, Coke & Chemical Workers (CIO)	15	6,819***	14.0
"Company Unions"	7	6,571**	13.6
International Union of Mine, Mill & Smelter Workers (Ind.)	4	720	1.5
Oil Workers International Union (CIO)	3	462***	0.9
Other Unions	12	6,414***	13.2
TOTALS	71	48,560	100.0

* "No. of Employees" figure missing from 3 contracts.
** "No. of Employees" figure missing from 2 contracts.
*** "No. of Employees" figure missing from 1 contract.

Patchwork, No Pattern

In material make-up, the chemical industry is smoothly organized, like a well regulated technocracy; but from the standpoint of labor unions, the chemical industry is a veritable bedlam.

Among zealous unionists, there is weeping, wailing and gnashing of teeth because in this industry:

- Less than 50% of its approximately 600,000 hourly paid production and maintenance workers are organized into unions, or are covered by union contracts.
- Instead of one big union, there are more than a dozen labor unions and even more company unions competing for the membership of chemical employees.
- There is no standardization of wages and working conditions.

Muddled Melee: These facts became broadly apparent in a CHEMICAL WEEK survey of 71 contracts between chemical companies and unions. These contracts, which are among many on file at regional offices of the Bureau of Labor Statistics regional offices, cover chemical plants located in 25 states.

The study brings out this picture of union activities:

Three large unions are leading in the race for membership, but no single union is dominant. Once a union wins the right to bargain for a group of employees, it begins a fight for union security. Nearly all bargaining is on an individual-plant basis, and so in these contracts there is diversity in all directions.

Leading Rivals: In the entire chemical industry, first place in total membership is claimed by the International Chemical Workers Union (AFL), headed by H. A. Bradley, with about 100,000 followers. Martin Wagner's United Gas, Coke & Chemical Workers (CIO) can be figured in second place. Next in line is District 50 of the United Mine Workers, whose chief is A. D. Lewis,* brother of UMW Czar John L. Lewis.

However, in the 71 contracts studied in this survey, District 50 was on top in number of employees covered, as shown in the accompanying table. Other unions not listed separately are Textile Workers, Packinghouse Workers, Alkali Workers, Fur & Leather Workers, Brotherhood of Painters, Grain Millers, Automotive Chemical Products, and Allied Trades Council.

"Company unions" include Procter & Gamble Employees Association, National Products Refining Co. Employees Association, General Aniline & Film Employees Organization, Niagara Hooker Employees Union, and Employees Association, Inc., of Colgate-Palmolive-Peet.

Union Shop Combat: In their campaign to make the union shop a fixture in the chemical industry, the unions appear to be gaining ground, particularly in the Midwest. In 50% of the contracts studied, employees

* The top illustration on the cover shows (l. to r.) Wagner, Bradley, Lewis.

must be union members to hold their jobs.

Several companies shell out premium pay only for workers on the third shift. Where shift differential pay was specified, lowest hourly rate was 4¢.

Dunning Made Easy: In most cases, unions avoid the tedious work of collecting dues by getting the chemical companies to take this money out of employees' pay checks. Usually, the contract specifies only dues and initiation fees; but in at least one case —International Minerals & Chemical Corp. at Buffalo, N.Y.—the company also withholds union assessments.

Customarily, before dues may be deducted, each employee must give the company a written authorization. Sometimes that authorization may be revoked at any time; in other case, it can be withdrawn only after a certain period of time or when the union contract expires.

One working condition that is almost standardized in the chemical industry—for the present, anyway—is the 40-hour week. Of the 19 contracts perused in the New York regional office, only one called for a 48-hour work week, and even there time-and-a-half rate was being paid for all work over 40 hours. Among the agreements filed at Chicago, two guaranteed time-and-a-half for work over 44 hours, and two (Dow Chemical and Parke, Davis) offered time-and-a-half for work over 35 hours.

Odds & Ends: These chemical labor contracts contain scores of unusual clauses that reflect the individuality of the men who negotiated the pacts. For example, the agreement between Rexall Drug and Gas-Coke at Boston states that the union agrees its members will assist the company in simplifying and improving methods and job performance. At Central Chemical's plant in Hagerstown, Md., Gas-Coke agrees to help reduce absenteeism.

Second most frequently adopted type of union security clause (28%) was that in which the company promises to recognize the union as sole bargaining agent for certain groups of workers. Next most popular (20%) was "maintenance of membership," in which an employee who joins the union must continue as a member for the life of the contract.

Only one contract in this survey contained an "open shop" provision. This case involved a "company union."

Battle for Holidays: Unions like to get as many paid holidays as possible, as one means of keeping members happy, so this item serves as a basis for illustrating the absence of uniformity in chemical contracts.

As the table shows, seven holidays a year are about average in the industry. But look at these extremes: Pharma Chemical Corp., Bayonne, N.J., is giving its employees (who are represented by Gas-Coke) 12 paid holidays a year; while no fewer than seven firms are granting only three.

On vacations, there's a similar contrast. At some plants, the maximum vacation is four weeks, while others are offering not more than two weeks.

Swing Shift Bounty: Most common premium pay rates for night shifts were 5¢ an hour extra for second shift and 10¢ for third shift, but the exceptions were numerous and widely divergent. Some companies don't have any shift differentials, and some pay the same rate for both swing shift and night shift.

Most generous differential pay rates in this survey were those of Hooker Electrochemical at Niagara Falls, N.Y.—18¢ an hour premium pay for both afternoon and night shifts. The employees at that plant are represented by a company union.

Some companies pay the entire cost of a welfare fund, others share this expense with employees. Some contracts provide for a permanent arbitrator or board to settle disputes; others call for appointment of temporary arbitrators as issues arise. Some companies give full pay for time spent on jury duty, others grant full pay minus jury pay, and some have no provision for pay while serving on juries or election boards.

Seniority, sick pay, maternity leave, pensions, cost-of-living bonus, insurance, hospitalization, death and injury payments—all these and many other items go into union contracts. And every new benefit gained at one chemical plant instantly becomes a goal for unions in all other chemical plants. There's cut-throat competition in the business of unionizing.

Number of Paid Holidays Per Year

	5 or less	6, 7 or 8	9 or more
ICWU (AFL)	3	12	2
UGC&CW (CIO)	2	9	3
Dist. 50, UMW	4	6	0
Company Unions	0	8	0
IUMM&SW	1	3	0
OWIU (CIO)	0	3	0
Other Unions	0	9	3
TOTALS	10	50	8

COMPANIES . . . .

National Distillers Products has bought the business and assets of Algonquin Chemical as part of its chemical expansion program, and has sold the White Rock Co. in withdrawing from the soft drink field.

• Algonquin, manufacturer of chlorine, caustic soda and sulfuric acid, has plants at Huntsville, Ala.; Dubuque, Ia.; and Lawrence, Kans. It gives National an assured supply of these basic raw materials.

•

Eagle-Picher Co. has bought 98% of the common stock of Ohio Rubber Co. for $7,981,350. Ohio Rubber has plants at Willoughby, O.; Conneautville, Pa.; and Long Beach, Cal.

•

Standard Oil Co. (Calif.) has purchased a 2,000-acre tract of land north of Seattle as a possible site for a refinery. Price was more than $900,000 for the property, located near Standard's storage facilities at Richmond Beach.

EXPANSION . . . .

Fertilizer: Deere & Co. has bought an additional 180 acres of land in Pryor, Okla. Adjacent to the 320-acre site on which the company plans to build a fertilizer plant, the land "is necessary to handle operations of the proposed plant," officials say.

•

Uranium Ore: Vitro Chemical Co. is completing a $1.1 million expansion program of its Salt Lake City plant to mill 300 tons of non-vanadium type uranium ores daily. End product of the plant, originally the war-built Kalunite Plant, is uranium oxide.

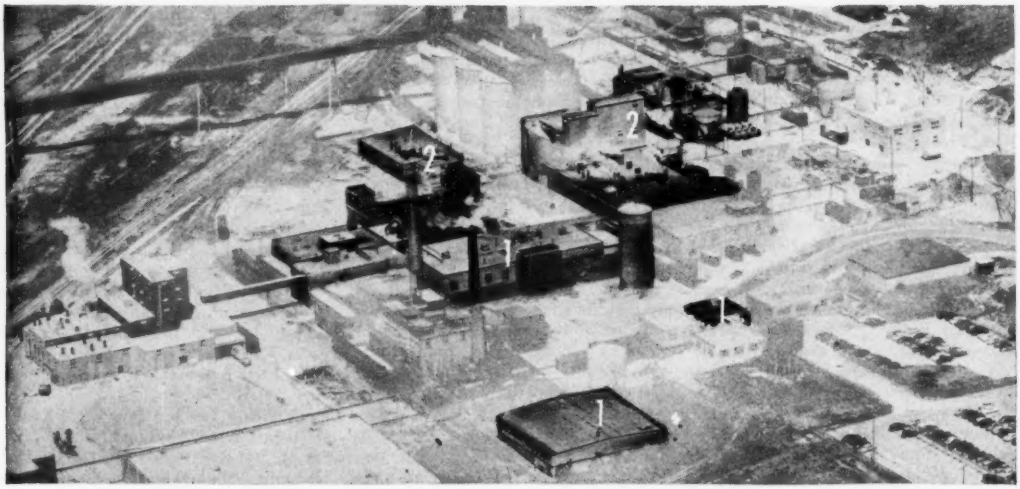
•

Smokeless Powder: Revised target date for the reopening of the first of six powder lines at the Indiana Ordnance Works, Charlestown, Ind., is August 8. Early June had been the original date, but labor difficulties slowed the rehabilitation program.

• Two other lines are scheduled to be in production this summer, and contracts have been let for restoration of the other three.

•

Sulfur: Abitibi Power and Paper Co.'s sulfur-from-pyrites plant, now under construction at Port Arthur, Ont., will be in operation by fall. Capacity is 10 tons of equivalent sulfur a day. Normetals Mining, Noranda, Que., will supply iron pyrites.



BLOCKSON's JOLIET PLANT: Current spurt outstrips expansions 1 ('26-'33) and 2 ('34-'44).

Growing with Detergents

First public offering of Blockson Chemical stock sheds light on a company that has boosted its sales from $2.9 million to $26 million in a decade.

Sodium phophates for synthetic detergents have been the keystone of its success; sales and plant expansion been tied to that market.

Reason for stock sale is inheritance tax reserve, not capital for expansion. But the company has a healthy surplus on hand, a $4 million sulfuric plant under consideration.

The first public offering of Blockson Chemical Co. common stock, 500,000 shares at $7.50 par value (*CW, June 21*), has not been an unqualified success. Offered at $29 a share, about 90% was disposed of at that price by underwriters; the remaining 10% has been either retained by those handling the issue or has been put on the market where it has moved at a somewhat lower figure.

This, of course, is not unusual in today's market when large numbers of shares of high price-to-earnings ratio stock have been sold. Other chemical companies have had the same experience lately; after the initial depression, the stock usually inches up to or passes the asked-for price.

But from the Blockson point of view, the sale was a success. The 500,000 shares were reclassified from the holdings of the Block family (principally those of brothers Louis, William and Edward), and the $13,775,000 proceeds guaranteed by the underwriters* accomplished the purpose of the sale: To put the family in a more liquid position so that, in case of the death of one, no sale of stock to meet inheritance taxes would be forced upon it.

The public now holds 500,000 shares; the Blocks, roughly one million.

Tied to a Winner: Not only did the sale spread the ownership of the Joliet, Ill., company and improve the cash position of its founder-owners, but it also raised and answered this question for the industry: "What's the story on Blockson?"

It's a story of growth tied to the synthetic detergent industry. Blockson's sales have zoomed in the past decade: $2.9 million in 1942, $26 million in 1951. Most of this increase dates from 1947, and in the main can be attributed to the swelling demand for sodium tripolyphosphate, builder for detergents. Last year, 60% of sales were products used in household detergents.

Even more striking is its growth in physical plant (*see cut*). Outlined areas marked "1" are 1926-33 construction, those marked "2", 1934-44. Again, major expansion has been within less than a decade, for all other facilities on this 40-acre operation are 1945-to-date. And there's room on the 230-acre site for plenty more of the same, with additional land reserved for waste disposal.

Blockson is one of four leading producers of sodium phosphates in the U.S., estimates it produces 20% of the tonnage. Unlike the other three (Monsanto, Victor and Westvaco), it makes the starting material, phosphoric acid, by the wet process—sulfuric acidulation of phosphate rock. This is an economical process for a company like Blockson, heavy in sodium phosphates and doing no business in organic phosphates or any product requiring elemental phosphorus.

The company's expansions have kept pace with the burgeoning synthetic detergents. Present facilities, at full capacity, could produce 15% more than last year; and they are so designed to permit another 20% expansion when necessary.

But the detergent industry is by no means the only market for the company's phosphates. They are used, of course, in scouring cleansers, printing inks, vitreous enamels, glass, water treatment, insecticide formulations, oil

* Of the $29 price per share, the underwriters' expected fee was $1.45; Blockson's guaranteed return, $27.55.

well drilling, etc.—almost everywhere water is used in cleaning or industrial processing. Most sales are to some 600 manufacturers or processors; a few are through jobbers and distributors, and export sales are minor.

Well Located: Although its period of greatest growth has been over the past few years, Blockson actually goes back to the turn of the century; the family has been in the chemical business in Joliet since 1902. The Blockson Chemical Co. as such, however, came into being in 1926, to make trisodium phosphate, which had become popular as a cleaning agent and soap builder.

Joliet proved an ideal site because of its water transportation and railroad facilities, and because it is in the heart of the country's hard water area. Raw materials were close by (sulfuric acid in Illinois, phosphate rock in Tennessee, alkalies in Michigan) and it is only forty miles from the large Chicago market.

To gain independence from outside sulfuric acid supplies, Blockson built its first acid plant in 1942, added a second in 1945, a third in 1950. Again the river site figured; sulfur could be barged up from the South.

Some diversification was initiated when the company began to sell a few byproducts like sodium fluoride, sodium silicofluoride, laundry sours, fertilizers and surplus acid. Most recent is a $250,000 plant for recovery and sale of uranium to the AEC, though this is more of a defense than a profit venture.

Moving Out: In operating as a closely-held family operation, the company plowed earnings back into the organization (almost $13 million from 1947 to 1952). A consistent dividend policy has been set up for the publicly-owned stock, but the Block family, with 67% of the shares, retains voting control of this dividend policy. The company expects to continue to retain earnings in its expansion program.

With about $6.5 million in earned surplus in the kitty, it has plenty to start with. The company might take a vertical step by acquiring its own reserves of phosphate rock and other raw materials. It has a certificate of necessity for a $4 million sulfuric acid (from iron pyrites) plant, and the project is under study. If this gets the go-ahead, Blockson will be making more sulfuric than it requires. Selling the surplus would be a horizontal step.

Whether Blockson goes one or both ways, the chemical process industries will keep its eye on this company with such a substantial growth record, and plenty of room for expansion.

Statistics on Scientists

Chemical engineers and chemists are as record-conscious as any other group of Americans. That's one reason why members of these professions have been awaiting the results of the National Scientific Register's Survey showing how old the average engineer or chemist is, where he works, his military status, what his training is, how much he earns. But more important is the need for this information in dealing with manpower problems arising out of mobilization.

The survey was conducted in mid-1951 by NSR with the cooperation of the American Chemical Society. Although a complete report is now being prepared, the Bureau of Labor Statistics, working with NSR, has published the highlights of the findings. Over one-half of the 100,000 chemists and somewhat less than one-third of the 45,000 chemical engineers in the professions in 1951 were covered. The 3,900 women included among the chemists represented over half of the women in the profession. In addition, 6,000 graduate student chemists and 1,000 graduate chemical engineering students were polled.

Young Men: Median age of the engineers—one of the youngest professional groups in the country today—was 32, that of chemists, 35. Only one engineer in five had reached 40, as against one in three chemists.

Some 84% of chemical engineers still following chemical engineering—90% of those surveyed—and 67% of chemists holding jobs in chemistry—95% of those polled—were employed in manufacturing industries. Very few chemical engineers worked for government agencies or for educational institutions (4% in each case); but 14% of chemists were in education, 8% with various levels of government.

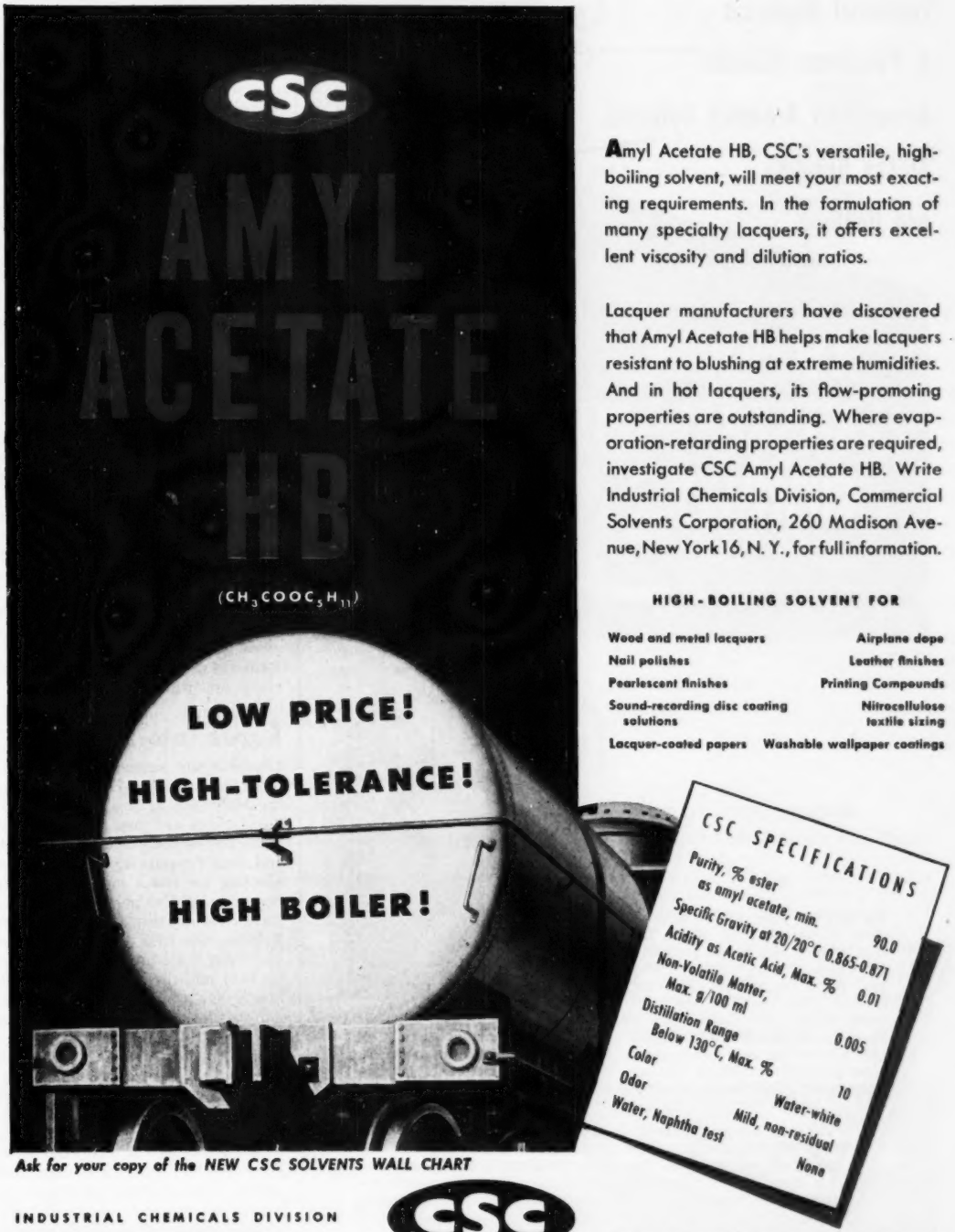
Not quite half the engineers in manufacturing were in chemical industries, somewhat smaller than was the case for chemists—53%. Of those in the chemical process industries, 48.3% of chemical engineers and 53.2% of the chemists were with companies producing chemicals.

Petroleum claimed the next largest proportion—21.2% of the engineers, 11.2% of the chemists—with food and kindred products (4.2% and 7.2%, respectively), rubber products (2.0% and 4.3%), paper and allied products (3.5% and 3.0%), stone, clay and glass products (2.0% and 2.3%), primary metals (2.0% and 2.7%), machinery, except electrical (4.4% and 1.4%), electrical machinery (2.6% and 2.5%), professional and scientific instruments (1.9% and 2.7%) trailing in that order.

Many on Call: A sizable number of both chemists and chemical engineers would be affected by any general call-up of reserves. One out of every four engineers and one out of every six chemists in the 1951 check were in the reserves. The proportion in the reserves was highest in the 26-34 age bracket for engineers (33.4%) and chemists (24.2%) alike. Of men under

MEDIAN INCOME OF CHEMISTS, ENGINEERS

Age Groups	Chemists	Chemical Engineers
All ages	$5,500	$5,600
Under 25	3,400	3,700
25-29	4,100	4,600
30-34	5,400	5,900
35-39	6,500	7,300
40-44	7,000	8,100
45-49	7,300	9,800
50-54	7,800	11,000
55-59	7,900	11,400
60-64	7,400	11,700
65 and over	6,800	Over 15,000



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Lacquer manufacturers have discovered that Amyl Acetate HB helps make lacquers resistant to blushing at extreme humidities. And in hot lacquers, its flow-promoting properties are outstanding. Where evaporation-retarding properties are required, investigate CSC Amyl Acetate HB. Write Industrial Chemicals Division, Commercial Solvents Corporation, 260 Madison Avenue, New York 16, N. Y., for full information.

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26, 12.7% of chemists were on active duty, 10.2% of engineers.

Although chemical engineers hold doctor's degrees more often than do other kinds of engineers, they do not hold them as frequently as chemists. Of those surveyed, 24% of chemists had Ph. D.'s, but only 7% of the engineers. Seventeen percent of chemists had obtained master's degrees; 20% of the engineers held master's or second degrees. Only a small percentage of chemists (5%) and chemical engineers (2%) did not have a college degree.

Chemical engineers tend to earn more than chemists of comparable age, and the difference is widest in the older age groups as shown by the accompanying table of median income at various ages.

As is generally true, those in private industry tended to have higher incomes than those of comparable age in other types of employment. Among engineers, government workers were the group with the lowest median income at every age level. The high income received by engineers in education, as indicated by the survey, was interpreted as a reflection of supplementary fees from consulting, royalties, and other sources which faculty members of engineering schools have many opportunities to earn.

Lapse Into Purity

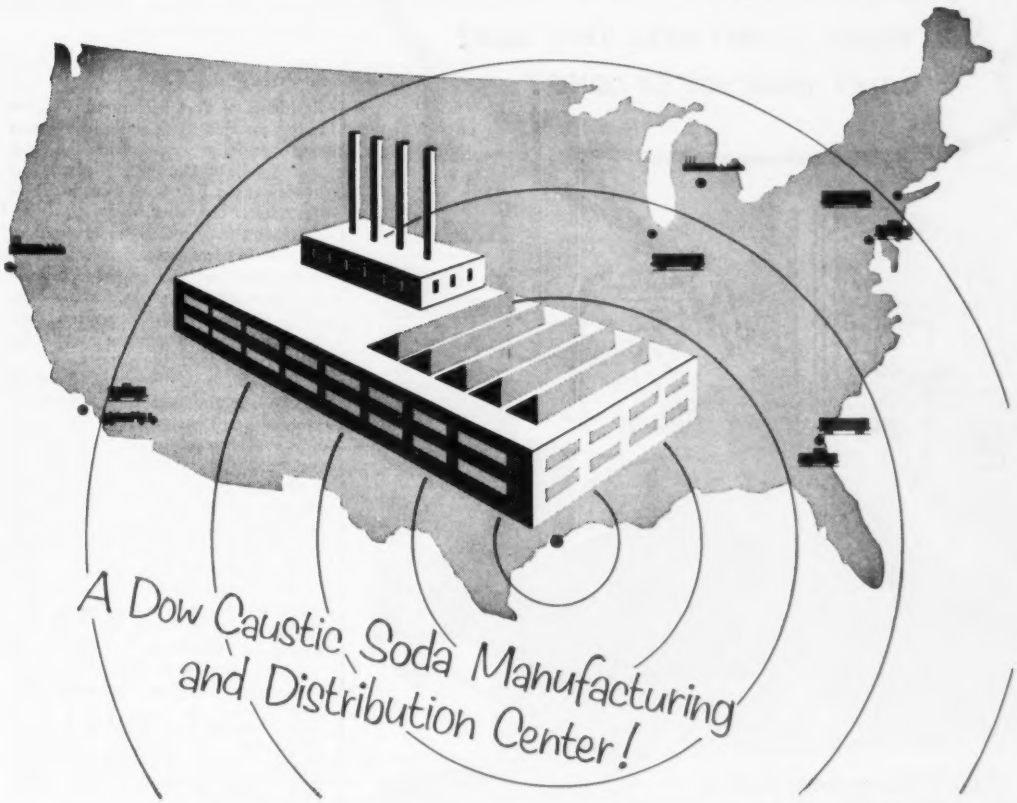
Chemists and engineers from Ohio's State Department of Health are giving the Mahoning River a virtual metabolism check-up, now that the steel strike has forced the closing of mills and blast furnaces along the stream, allowing the state's murkiest river to lapse into relative purity.

From its source near Alliance to where it leaves the state, near Lowell, the Mahoning is used by more than a dozen steel mills and fabricating plants, mostly for cooling purposes. Other industrial plants and some cities dump raw sewage into the stream.

Too Hot For Fish: As a result, this "open sewer," as Buckeye natives often call the river, is brimming with all kinds of waste matter. After absorbing heat in the steel mills, the water often has a temperature of more than 90 degrees in summer, and seldom is cooler than 60 degrees in winter. Some people hold that the organic sewage is effectively decomposed and rendered harmless by the spent acids and other industrial wastes, but this is a controversial claim.

At any rate, the scientists are busy taking advantage of this chance to measure acidity, alkalinity, mineral

how close are you to Freeport, Texas?



The Chemical Industry Needs Hundreds of Thousands of Tons of Caustic Soda Each Year!

In the chemical industry, prompt caustic soda delivery is of the greatest importance in keeping production steady. For this reason Dow maintains an outstanding network of distribution facilities. In addition to Dow's caustic soda producing plant and complete distribution center in Freeport, Texas—Dow operates caustic soda plants in Midland, Michigan and Pittsburg, California. Dow caustic soda solution is shipped from bulk tank terminals in Los Angeles, California; Carteret, New Jersey, and Charleston, South Carolina. Caustic soda solid, flake and ground flake are shipped from terminals in Port Newark, New Jersey; Chicago, Illinois and Charleston, South Carolina. All of these distribution points play an important part in providing the chemical industry with the superior service it requires.

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and phenol content while the mills are idle. Findings will be used to determine treatment needed to clean up what is acknowledged to be the worst polluted stream in Ohio.

Costly Fumes

Residents of Port Richmond, Pa., are lining up this week with hands outstretched for payments from the General Smelting Co. in settlement for losses caused by fumes from a fire in the smelter last week.

Blazing in a compartment containing 15 tons of zinc oxide, the fire spewed out dense clouds of zinc oxide and zinc chloride fumes, forcing hundreds of persons to flee from their homes. Scores of persons reportedly became sick from the vapors.

Plant Superintendent E. Kenneth Jakob said the company's insurance probably will cover claims for doctor bills and loss of work, and assured residents the company "would do everything possible to see that nothing like this would ever recur." He denied that there were any sulfur fumes involved, and said the zinc fumes would cause a person no lasting harm.

KEY CHANGES . .

George S. Bachman: To director of research, Pittsburgh Plate Glas Co.'s Fiber Glass Division, Pittsburgh, Pa.

John Conway, J. A. Field, and W. A. Woodcock: To assistant managers, Union Carbide and Carbon Corp.'s Fine Chemicals Division, New York, N. Y.

Edward V. Osberg: To general manager, National Polychemicals, Inc., Boston, Mass.

Arthur C. Bryan: To vice-president in charge of sales, National Carbon Co., a division of Union Carbide and Carbon Corp., New York, N. Y.

Richard H. Shaffner: To sales engineer, Prufcoat Laboratories, Inc., Cambridge, Mass.

Thomas H. Risk: To vice-president, R. M. Hollingshead Corp., Camden, N. J.

Gilbert E. Goheen: To director of research and development, J. T. Baker Chemical Co., Phillipsburg, N. J.

Johnstone S. Mackay: To supervisor, research and development department, Pittsburgh Coke and Chemical Co., Pittsburgh, Pa.

Eugene N. West: To assistant sales manager, Lever Division, Lever Bros. Co., New York, N. Y.

Williams' Titan Crusher served by custom-built Farval centralized system

THE lubrication problem was this: How to keep the rotating spindle bearings on the novel crusher (at right) working dependably and efficiently in an important ore preparation plant.

The plant engineers knew that pulverizing and crushing stubborn flint-like ore creates tremendous bearing pressures and that meant that constant lubrication care was a must. They also knew that getting a lubrication system onto a rotating portion of a machine had always presented a ticklish problem. Yet, to stop the machine for guess-and-by-gosh hand oiling meant production hours wasted and, at best, a hit-or-miss lubrication job.

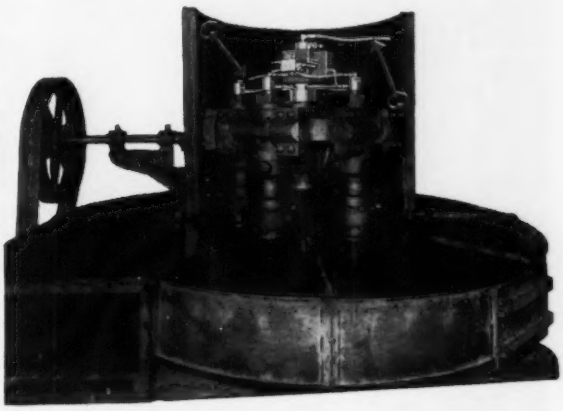
To cope with the special problems presented by this ore crusher, Farval engineers were called in and soon came up with a modern custom-built solution for lubricating constantly moving bearings. In a unique rotating connection and by means of tough, flexible hoses and a reversing element, the Farval Centralized Lubrication System was tailored to body-fit the gyrating portions of the crusher. This practical approach to machine preventive maintenance saves time and men, saves lubrication (as high as 75%) and most important, increases production.

Farval has proven itself in 25 years of service to industry. It is the original Dualine system of centralized lubrication. The Farval valve has only two moving parts —is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its wide valve ports and full hydraulic operation, Farval unfailingly delivers grease or oil to each bearing—as much as you want—as often as desired. Indicators at every bearing show that each valve has functioned.

In or near your city, there is a Farval engineer ready to serve you with your special or conventional lubrication problems. Write now for Bulletin 25 and a full description of the Farval system at work. The Farval Corporation, 3291 E. 80th St., Cleveland 4, Ohio.

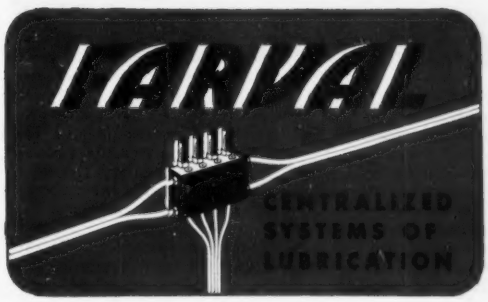
Affiliate of The Cleveland Worm and Gear Company, Industrial Worm Gearing. In Canada: Peacock Bros. Ltd.

FARVAL—*Studies in Centralized Lubrication* No. 135

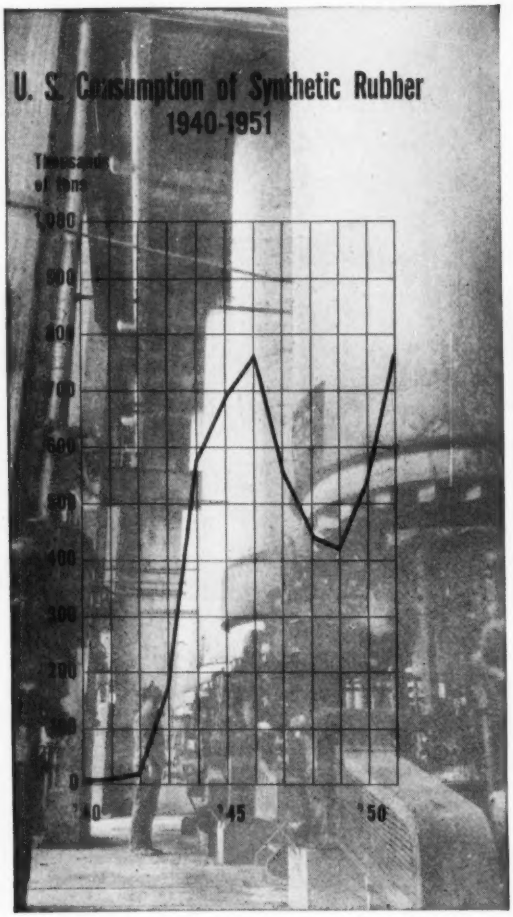


KEYS TO ADEQUATE LUBRICATION— *Whenever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.*

Illustration by courtesy of Williams Patent Crusher and Pulverizer Co.



Life ...on the



GROWTH OF THE SYNTHETIC RUBBER INDUSTRY has been the most important single development in the rubber field during the past fifty years. Cyanamid's pioneering development and manufacture of acrylonitrile as a base chemical for synthetic rubber is an outstanding example of the way Cyanamid continues to pace new industrial developments through chemistry. Acrylonitrile-butadiene rubber can be made with a wide variety of properties and is used in the making of many and varied types of rubber articles. Cyanamid is expanding its acrylonitrile facilities by building a new plant in Louisiana to manufacture this important chemical from natural gas. Acrylonitrile is but one of a whole group of Cyanamid chemicals including ANTI-OXIDANT* 2246, PEPTON® 22 Plasticizer, accelerators, retarders and pigments, that help the rubber industry to produce better and more durable products. *Trade-mark

For maximum comfort and protection, Bill Bridgeman, famous test pilot, wears Toptex Helmet made of reinforced LAMINAC.

PLASTICS are a segment of the chemical industry which has shown a most striking growth in the last few decades. Cyanamid pioneered with three types, all thermosetting. Starting with BEETLE® Urea Resins in the late 20's, the company went on to develop its MELMAC® Melamine Resins in the late 30's. With these materials, a complete range of colors was made available for the first time in a thermosetting plastic. In the early 40's the company introduced LAMINAC® Polyester Resins which also represented a notable advance, since they can be cured with or without heat and pressure. The growth of this type of plastic alone is indicated by a report from Republic Aviation: whereas this type of plastic was used in only 5 parts per plane in World War II, today's F-84 jet contains 225.

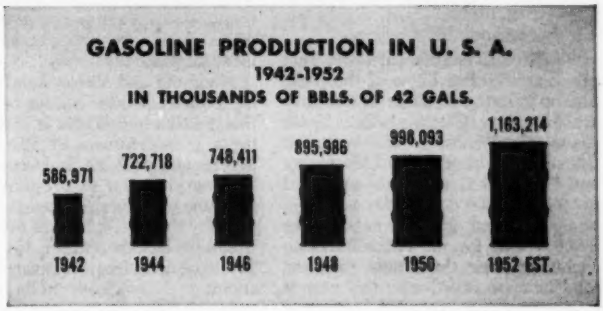
Courtesy of Western Machinery Company

FROTH FLOTATION OF ORES, throughout its almost fifty-year history, has never been more important as a process for the concentration of ores than it is today. Depletion of high-grade ores and the increasing need for metals from rare ores make froth flotation research at Cyanamid's Stamford Research Laboratories a vital service to the minerals industry. Laboratory development of AEROFLOAT® Reagents and new flotation processes by Cyanamid have helped Cyanamid keep ahead of new mining developments. For the first time in history, commercial froth flotation of iron ores will become a fact during the coming year to add to our strategic domestic iron ore reserves.

Chemical Newsfront

NEW STORAGE AND BLENDING FACILITIES FOR PHOSPHATE ROCK at Cyanamid's Brewster, Florida, plant indicate the increasing importance of this basic chemical to agriculture and industry. Begun in 1868, phosphate rock mining in the United States has been geared to the continually rising demands of agriculture; now produces over 9,000,000 tons a year. The new rotary stacker-conveyor shown expands Cyanamid's storage capacity, permits more accurate blending of phosphate rock for the fertilizer and chemical industries. Blending is done on underground conveyors directly beneath semi-circular piles. The blended rock is then conveyed into the plant for drying and shipping. This is but one of many products developed by Cyanamid for the care and improvement of our land and the protection of its crops and livestock.

U. S. GASOLINE PRODUCTION has increased steadily since 1942, the year Cyanamid began commercial production of AEROCAT® Synthetic Fluid Cracking Catalysts. To further the nation's civilian and military production of high-octane motor fuels, Cyanamid is expanding its production of MS Catalyst at its Fort Worth, Texas, and Michigan City, Indiana, plants to a level sufficient for approximately 1,000,000 barrels daily of refining capacity. Cyanamid, as the first producer of microspheroidal synthetic fluid cracking catalysts, has constantly offered the widest range of grades to suit any petroleum refining unit.



Phosphorus: Shifting, Growing, Changing

Three new phosphorus furnaces due to be finished this fall will boost total annual capacity to about 270,000 tons—up 30% from last year.

Keener competition looms for existing phosphate markets. Reasons: higher output, slower growth of synthetic detergents, stepped-up activity among "wet" processors.

Each producer is jockeying for advantage by developing new products and new markets; by locating new facilities, largely in the West, near cheap rock and power; by trimming process costs.

by Joseph Gordon*

Confident in the future of elemental phosphorus, three producers are rushing completion of Western facilities to meet a scheduled fall deadline.

They're breathing easier now than they did shortly after construction began late last year. At that time they faced a dilemma: The postwar pell-mell rise in demand for sodium tripolyphosphate, a major phosphorus outlet and the foremost builder for synthetic detergents, suddenly lost momentum. Output fell off from nearly 30,000 to 25,000 tons a month.

But the companies went ahead with their expansions, figuring that tripoly would make an early comeback and that other volume uses would be ready to keep the furnaces busy. Subsequent events proved their good judgment: after three months, tripoly output was heading for a new peak.

Big Three: The producers who went ahead are the Big Three of the phosphorus industry. In order of size they are Monsanto Chemical Co., Victor Chemical Works, and Westvaco Chemical Division of Food Machinery and Chemical Corp. Their combined capacity by the end of this year will be 200,000 tons out of a total of about 270,000 tons for the entire industry. Including their three new furnaces, total increase in capacity this year is a whopping 30% over 1951.

Much—if, indeed, not most—of this expansion has stemmed from the mounting demand for synthetic detergents and the tripoly to build them. The same market underlies most of the phosphorus expansion since the war. To keep pace with demand, producers boosted output from 85,000 tons a year in 1945 to 160,000 tons last year. But it appears that the current growth in phosphorus capacity is faster than the probable growth of synthetic detergents and accordingly of sodium tripoly, since about 85% of the latter is taken by that market. It is thus becoming increasingly clear that phosphorus makers shall have to diversify their markets even more than heretofore—as, indeed, they are doing.

ON THE MOVE

Three Faces West: By this present expansion, producers are taking the sort of calculated risk that brought them out West in the first place.

In 1949, Westvaco, then a newcomer to elemental phosphorus production, built its first furnace near Pocatello, Ida. Since then, on a one-a-year basis, Westvaco has completed two others and is now putting up its fourth, all at the same site.

Monsanto and Victor, long the two top producers, were not far behind in the Western trek. Victor is now building a second furnace at Silver Bow, Mont., alongside its first, completed late last year. For its Western debut, Monsanto is erecting what is reportedly the largest furnace ever built. It will be at Soda Springs, Ida., about 70 miles away from Westvaco's operations.

But despite this burgeoning in the West, Monsanto and Victor are still concentrated primarily in the long-established central Tennessee area. Monsanto has six furnaces near Columbia, Tenn., the latest and largest finished by the end of 1950. Victor has a group of four furnaces at Mt. Pleasant, and for good measure has one at Tarpon Springs, Fla., constructed about two years after the war and expanded later. Victor finally turned to the West, in 1950, for its next expansion; and in the middle of 1951, Monsanto decided on that course as well.

The decision to move to a location far removed from the primary markets in the East and the Midwest was not an easy one. The decisive influencing factor was the opinion that cheap and abundant phosphate rock and hydroelectric power would offset the cost of the long Eastward haul. Actually, the cost of rock and power usually represents about half the expense of producing elemental phosphorus.

Until a few years ago, putting up another furnace in Tennessee was the standard way to meet increasing demand. Rock was cheap there, important markets are within a few hundred miles, and low-cost power was available from the Tennessee Valley Authority (TVA).*

Today, the incentive for a private producer to install a new furnace in this region is not nearly so cogent as it used to be: As rock and power have become less abundant, they have become more costly.

But not all producers are jumping on the westbound bandwagon. Some are still focusing on the East Coast region, where low-priced rock (mainly in Florida) and short hauls to market are figured to counterbalance the dearth of cheap power.

Looking Eastward: Virginia-Carolina Chemical Corp. and American Agricultural Chemical Co., both of

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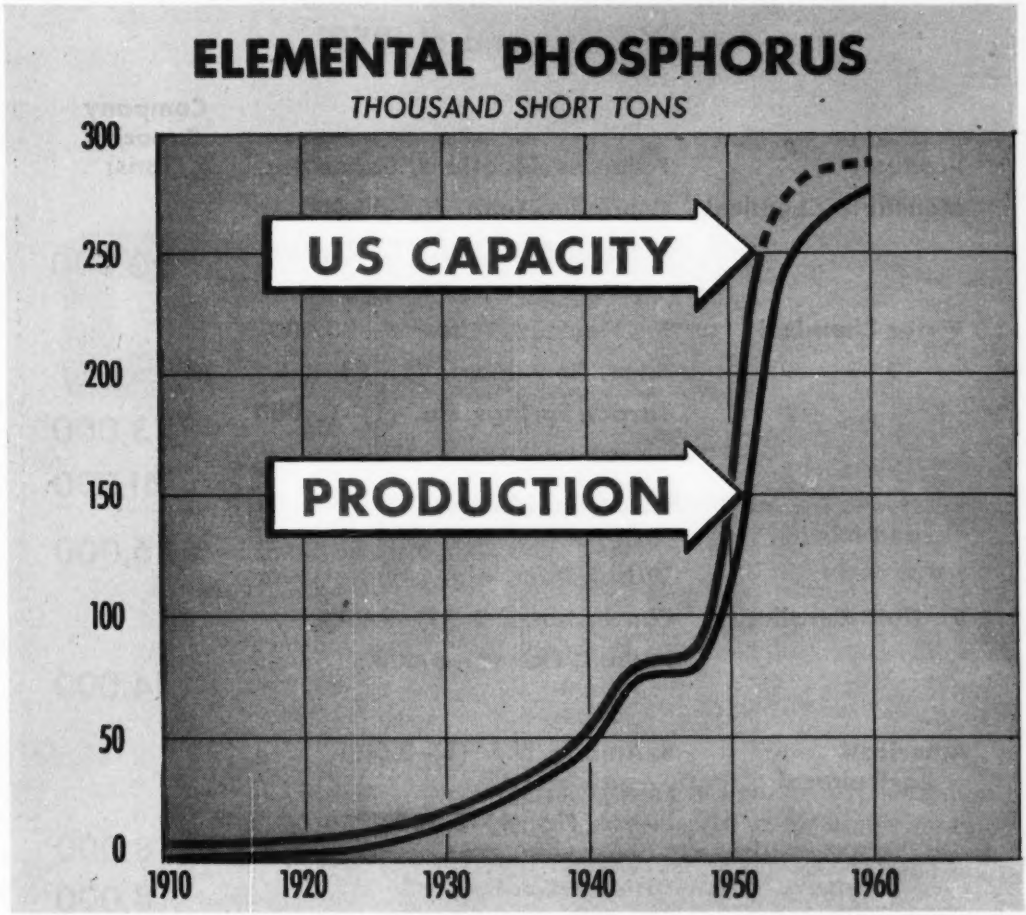
* In fact, TVA was one of the pioneers in elemental phosphorus production in this area. Even now it ranks fourth among phosphorus producers. Its output (33,500 tons in 1951), however, is mainly consumed by concentrated fertilizers.



which have extensive Florida rock holdings, are staying close to the Eastern seaboard. Each is an important factor in the production of superphosphate fertilizer, and each has two furnaces to make elemental phosphorus. American Agricultural completed a new furnace at Pierce, Fla., in May of this year, and rebuilt the initial one at South Amboy, N.J.

Last year, Virginia-Carolina brought in a furnace at Charleston, S.C., and modernized the one at Nichols, Fla. V-C's Charleston plant obtains relatively low-cost power from the Santee-Cooper hydroelectric project.

Oldbury Electro-Chemical Co., pioneer U.S. producer of furnace phosphorus, is located at Niagara Falls, N. Y. Though distant from rock sources in the U.S., Oldbury makes up for it by access to cheap Niagara power and major population centers.

Rounding out the phosphorus production picture is a new 6,000-ton-a-year furnace due to be built at Mount Pleasant, Tenn., by Shea Chemical Co. The output will be used exclusively to make dicalcium phosphate for animal feed supplements.

PROCESS CHANGES DUE

Rivals Abound: Lack of unanimity exists not only concerning localities, but also about processes.

During the ensuing period of growing phosphorus supply, competition among producers of the element is bound to sharpen. But a strong bid for phosphate markets is also being made by "wet" processors, who treat phosphate rock with sulfuric acid to make a dilute phosphoric acid. Most of this is utilized in triple superphosphate, but the acid can be concentrated and purified to yield a product suitable for the manufacture of technical-grade phosphates and polyphosphates. Here the wet-process acid comes into direct competition with the phosphorus-derived material.

Two producers*—Blockson Chemical Co. at Joliet, Ill., and General Chemical Division of Allied Chemical and Dye Corp. at Claymont, Del. make sodium tripoly and other polyphosphates by the wet process; and both of them feel secure in their competitive position. Blockson, the larger of the two, compares in tripoly output with the three major elemental phosphorus producers.

Wet process acid costs perhaps $10 a ton less to make than that derived from the element. But expense of concentration and removal of heavy metal impurities generally bars it from outlets requiring food-grade and pharmaceutical-grade products.

* American Agricultural also makes a relatively small quantity of phosphates.

Elemental Phosphorus Producers and Their Capacity (end of 1952)

Producer	Furnaces, Locations, Capacities	Company Capacity (Tons)
Monsanto Chemical	Columbia, Tenn. (6)—65,000	
	Soda Springs, Ida. (1)—25,000	90,000
Victor Chemical	Mt. Pleasant, Tenn. (4)—35,000	
	Silver Bow, Mont. (2)—28,000	
	Tarpon Springs, Fla. (1)—10,000	73,000
Westvaco Div. of Food Machy.	Pocatello, Ida. (4)	41,000
T V A	Wilson Dam, Ala. (4)	36,000
Virginia-Carolina	Charleston, S.C. (1)—9,000	
	Nichols, Fla. (1)—5,000	14,000
American Agricultural	S. Amboy, N.J. (1)—3,000	
	Pierce, Fla. (1)—5,000	8,000
Oldbury Electro-Chemical	Niagara Falls, N.Y. (1)	8,000
	Total Annual Capacity	270,000

Adversity may turn into fortune, however, for one of the heavy metal contaminants is uranium. The Atomic Energy Commission will pay for its recovery; and, under the AEC aegis, uranium recovery systems are now being installed by both Blockson and General Chemical. International Minerals & Chemicals Corp. is installing uranium recovery facilities in its new $10 million plant at Bonnie, Fla.; and other processors—especially V-C—are considering similar projects.

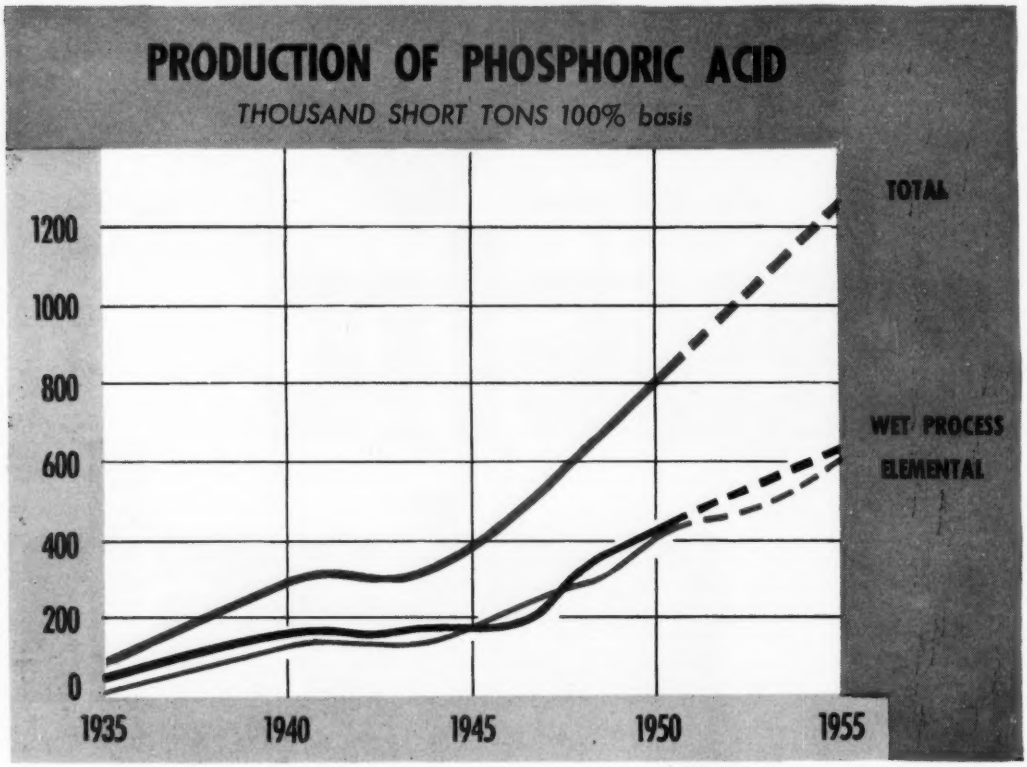
Until the economics of uranium recovery has been thoroughly worked out, its impact can't be estimated with any degree of accuracy. There is no question, however, but that it may affect future operations and plans of furnace producers as well as wet processors.

Economy Preferred: This is only one of the process developments that may affect production costs and hence prices and markets.

For example, Western producers are looking into the feasibility of recovering vanadium from phosphate rock. Wesvaco and TVA are both pursuing such investigations. The defense need and domestic shortage of vanadium suggest governmental underwriting or other encouragement of recovery facilities.

Also, growing interest in fluorine chemicals and dwindling U.S. fluorspar reserves are urging research and development on recovery of fluorides, which comprise about 3½% of most phosphate rock.

Still other economies are being realized through processing innovations. Virginia-Carolina, for example, has incorporated several in its Charleston operations. Use of Florida hard rack (though the supply is limited) bypasses the sintering step required in processing pebble and shale, and thus saves 30% on plant investment. V-C also runs its furnace at higher-than-usual voltage (over 280 volts), which



permits lower power and maintenance costs.

Rock handling is another area where economies have been made. V-C successfully uses a pipe line instead of trucks to move the rock. American Cyanamid has worked out an ingenious cost-cutting system to store and blend rock at its Sydney, Fla. mine.

TVA, in its extensive pilot-plant work, has tried out a slowly rotating furnace which is said to improve yields, cut power costs 10% to 15%, and eliminate sintering of the furnace charge.

Many other firms in the field have developed their own tricks to pare costs. Some are still in development, others are already in use; but there is no doubt that the prospect of tougher competition is spurring and speeding process development.

ROCK AND POWER

Rock Quest: Not only must each producer keep his costs down, but he must guarantee himself a long-term supply of phosphate rock or shale.

Monsanto and Victor face no early pinch in Tennessee. Monsanto, for example, has sufficient reserves there to last for approximately 23 years of capacity operation by its six furnaces. Even so, Monsanto buys a large part of its rock needs to stretch the supplies even further. For its four furnaces, Victor will continue to buy most of its rock requirements, preferring to hold in reserve some 2,000 acres in Maury and Giles counties. Victor's reserves would keep its Tennessee furnaces going full tilt for at least another 15 years.

But even the large deposits in Tennessee account for less than 2% of the U.S. total. Those in Idaho, Montana and Wyoming are the largest in the world, comprising 60% of the U.S. reserves. The Florida deposits account for most of the remaining 38%; and although about three-quarters of phosphate rock output comes from Florida, supply is adequate for hundreds of years.

Part of the Western phosphate land was opened for initial development by the government shortly after World War II, and more was made available in 1949.

Westvaco, first producer on the Western scene, signed a long-term contract for rock with the J. R. Simplot Co., which holds on government lease more than 2,000 acres of land near Pocatello. Like most of these contracts, this one provides for a basic minimum per ton with an escalator clause to cover changes in mining costs. Westvaco's rock supply is good for 35 years. At Soda Springs, Monsanto has leased reserves from the government, the state of Idaho, and private interests. Victor is developing mining properties near Silver Bow under government lease.

These government leases have no terminal date, although they are subject to renegotiation after twenty years. Terms are favorable for development, but generally rugged terrain makes mining and transportation a tough problem. Hence the cost of rock delivered to the plant is some $1 to $2 a ton higher than in Florida. There the terrain is level and deposits can be economically mined with draglines in open pits since the pebble rock matrix, usually 6-25 feet thick, is covered with a light overburden of perhaps 5-30 feet. Western rock—yel-

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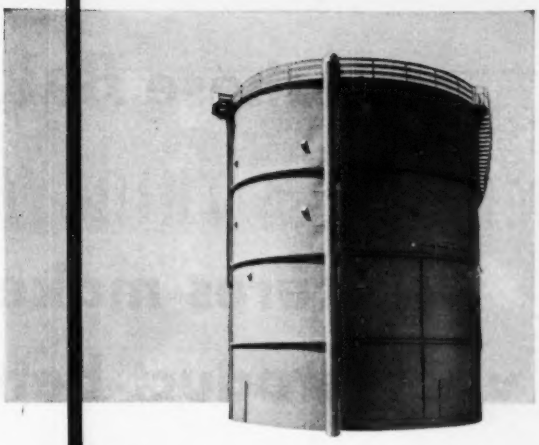

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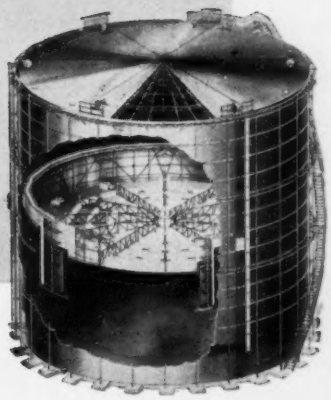

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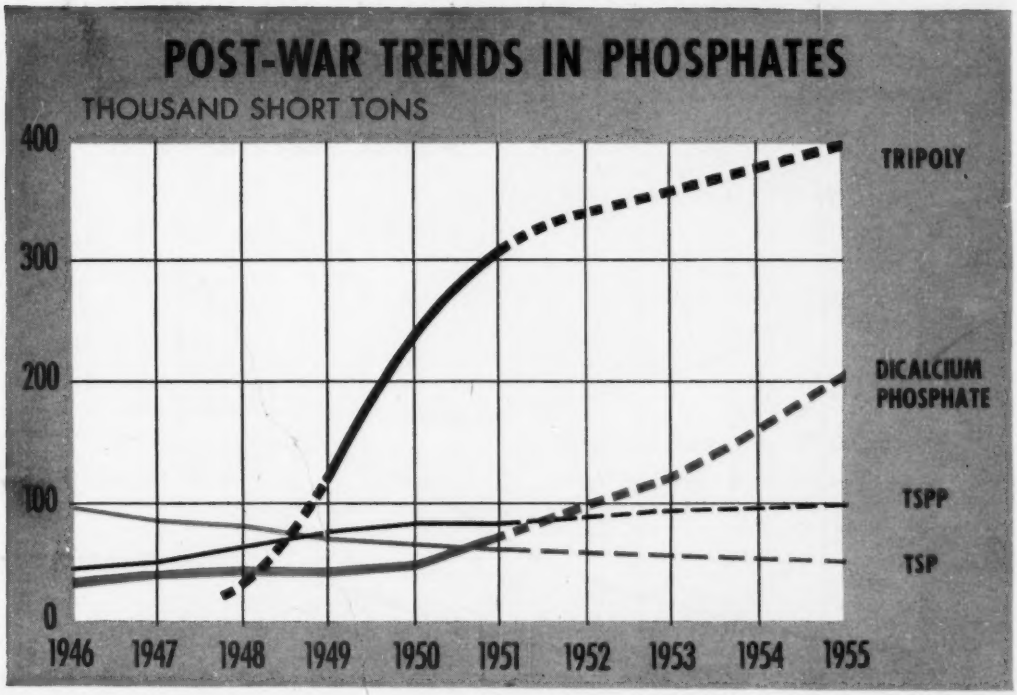


lowish-brown phosphatic sandstone and darker phosphate shales—is often only 4-7 feet thick with an overburden that may run to 60 feet.

These savings alone are strong inducements to use Florida rock; since about 7 tons of rock are required for a ton of phosphorus, the saving amounts to $7-$15 a ton—or 5-10% of the production cost.

More Power for Less: But the Western pioneers are counting on cheaper power to offset the costlier rock. Some 11,500-12,000 kwh are required to make a ton of phosphorus, and a difference of 1 mill per kwh thus adds up to $12 a ton.

Until recently Tennessee was an advantageous location since TVA sold power at around 2.5 mills per kwh. But the mounting needs of industry, atomic projects, and growing household use have left a power shortage in their wake. TVA has had to resort more and more to steam-generated power, and as a result hiked rates some 15% last year to large industrial users. Moreover, Tennessee phosphorus producers can expect the rate rise to continue, since within another five years half of TVA's power will likely be derived from steam.

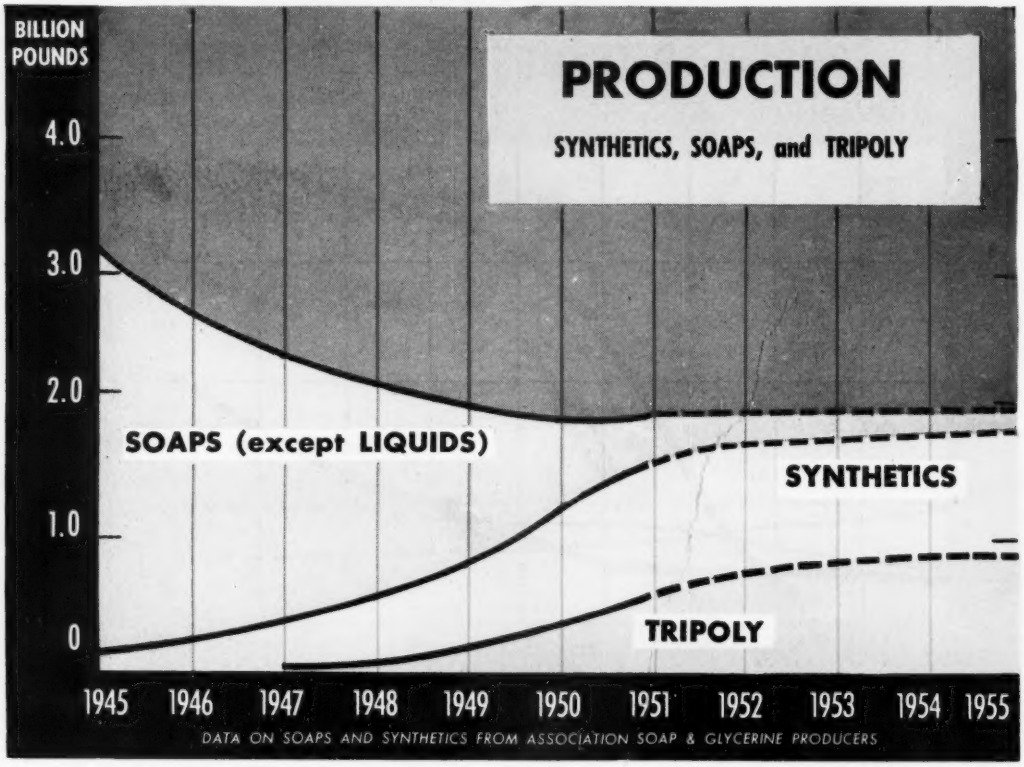
To producers of phosphorus, the mammoth hydroelectric projects in the West seemed a means of averting the specter of this power pinch. Harnessing the Columbia and Snake River power, government and private utilities have created possibly the largest cheap power area in the U.S. Other large hydropower plants there are in the process of construction. Hungry Horse Dam in Montana will have four 71,000 kw generators by the end of next year; two of them are already in operation, and Victor will be one of its important industrial customers. Westvaco will continue under contract with Idaho Power Co., and Monsanto's needs will be met by a new transmission system completed this year by Utah Power and Light.

Power rates for a given area depend of course on the source, amount, and kind of electric power, but on the average, the three producers in the West will probably be paying around 2.5 mills per kwh. For the same type of contracts, TVA rates are not much different, but by the time the new steam plants are built, rates of 3.5 mills may be more typical. Where power is primarily from steam, as in Florida, the rate is usually linked to the cost of fuel, and Victor is on such a basis with the Florida Power Corp. for its furnace at Tarpon Springs, with a contract that runs until 1966. Power which is wholly steam-generated in the South Atlantic states might run as high as 5-6 mills per kwh. However, Virginia-Carolina at Charleston is paying well under that because the power is mainly hydroelectric.

Despite producers' well-laid plans, there is a possibility that rising power needs for defense coupled with the low rainfall of the past year will intensify the power shortage in most areas, even in the supposedly power-abundant Northwest. Secretary of the Interior Chapman predicts another power shortage this fall and winter. Though cutbacks in interruptible power may not hit so hard this year as last, there is still an outside chance that lack of power could curtail full capacity operation of some Western phosphorus furnaces. Similarly, in the East, the reservoirs that furnish Santee-Cooper power are below normal level, and future developments point to more steam power there to meet mounting industrial needs.

HAUL TO MARKETS

All Around the Map: In the quest for cheap and plentiful rock and power, phophorus producers have perforce interposed a widening distance between the furnace and the market.



The furnace product, yellow phosphorus, has to be shipped hundreds of miles in special tank cars to processing plants, where it is then converted—close to the market centers—into phosphoric acid and other products.

Without constant vigilance, furnace producers could find their production economy and cheaper raw materials offset by the longer freight hauls and higher freight rates. Indeed, freight rates have been going up steadily since the war; and only recently the railroads were granted another 7% increase. This boost hits hardest those producers who were already paying the highest freight bills.

To lick the freight rates—over which they have little control—producers have deployed processing plants in strategic locations around the country. And most of them have been steadily increasing their processing capacity at these points over the past two years to accommodate the higher furnace output.

Monsanto has two major processing plants—at Trenton, Mich. and at Carondelet, Mo., just south of St. Louis—to make inorganic phosphates and polyphosphates. Other phosphates and intermediates for organics are made at Monsanto, Ill., just across the Mississippi River, and at Anniston, Ala. Though it does not as yet have a processing plant on the West Coast, Monsanto is not likely to build a big Western plant for phosphorus only to let this growing market plum go unchallenged to other producers.

Victor has four processing plants—Chicago Heights, Ill.; W. Nashville, Tenn.; Morrisville, Pa.; the A. R. Maas Division at Southgate, Calif.

Westvaco ships its phosphorus from Pocatello to three processing plants. The largest is at Carteret, N.J., another is at Newark, Calif., and the newest is at Lawrence, Kas.

Freight Fix: Westvaco has the longest average haul, but all Western producers are virtually in the same freight fix. Elemental phosphorus can likely be made (f.o.b. Western plant) for about $175-$200 a ton, to which must then be added the freight to the processing plant. With the latest freight increase, the haul to Lawrence from Pocatello costs $31 a ton; to Newark, $29.

From Silver Bow to Chicago, freight is about $39 a ton; but from Nashville to Chicago, only about $25 a ton. This $14 a ton difference is enough to offset one mill per kwh cheaper power in the West. But the Eastern haul from Silver Bow to Chicago is a bit cheaper than the Northern haul from Tarpon Springs. Thus it appears safe to assume that most of the Tarpon Springs output will go to Morrisville for processing.

Short hauls are, of course, more expensive than long ones in proportion to the distance. Shipping from Nashville to St. Louis—about 300 miles—cost $20 a ton, while the 2,200-mile haul from Pocatello to Carteret is close to $50 a ton, or about one-third the rate per mile.

Two Ways Out: One approach to offset the freight handicap is to persuade railroads to lower the rate as the volume of Western phosphorus grows.

Another alternative is to convert yellow phosphorus, which carries a high rate because of its hazardous nature, into red phosphorus, a safer variety to handle. Whether this is

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feasible depends on the volume of phosphorus, the freight differential, and the investment required for conversion facilities. For a plant turning out 20,000 tons of phosphorus a year, and with an assumed rate differential of ½¢ a pound, this conversion might arouse some interest. The facilities should entail an outlay of well under $1 million and should be paid out in about five years.

SELLING THE OUTPUT

In Many Directions: The above problems are long-term, and their solutions will evolve gradually. But the immediate problem requiring an immediate solution is how best to utilize and sell the current and soon-forthcoming phosphorus output.

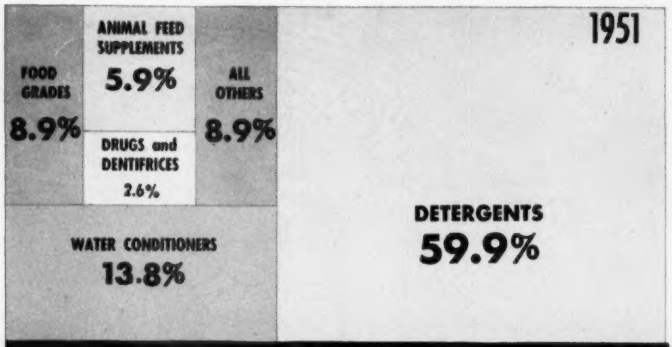
Only about a tenth of elemental phosphorus production is used as such or in intermediates like the chlorides, sulfides and others.

Altogether, in World War II, nearly 200 million lbs. of phosphorus was consumed in such military uses as smoke screens, incendiaries, tracer shells and the like. TVA supplied about 2/3 of the wartime demand; and during the last year of the war Virginia-Carolina operated the Nichols plant for the Chemical Warfare Service. Average annual requirements during that period were about 50 million lbs., which at the time represented about a quarter of the total output. The phosphorus market was soft for about a year after the war but picked up quickly as demand for phosphate builders increased. Requirements for phosphorus in today's partial mobilization have been about 7,000 tons a year, but military needs will rise to 17,000 tons for the year beginning in July, 1952.

Red phosphorus and the sesquisulfide have a fairly constant year-in-year-out use in safety matches. Oldbury is probably the leader in this business while American Agricultural and Electric Reduction of Canada, Ltd. divide the remainder. Minor outlets for phosphorus include phosphor bronzes and metal phosphides.

Phosphorus pentoxide is now used increasingly in glass, where it lends resistance to hydrofluoric acid and alkali. It also imparts valuable optical properties.

The oxide is an extremely powerful desiccant, finding use in physical and chemical dehydrations as a condensing agent in organic reactions, and in the manufacture of some organic phosphate esters. Lion Oil Co. has found it to be a superior additive for air-blown asphalt. The oxide has made appreciable headway in the last two years, and it appears that the trend will continue.



END USES OF INORGANIC PHOSPHATES

TYPE OF USE	SODIUM COMPOUNDS	CALCIUM COMPOUNDS	OTHERS	TOTAL
SOAPS and DETERGENTS	455,000		1,500	456,500
WATER CONDITIONER	105,000			105,000
FOOD GRADE PRODUCTS	30,000	36,000	2,000	68,000
ANIMAL SUPPLEMENTS		45,000		45,000
DRUGS and DENTIFRICES	6,000	13,000	1,500	20,500
OTHER USES	40,000		28,500	68,500
TOTAL IN TONS	636,000	94,000	33,500	763,000

The great bulk (about 90%) of elemental phosphorus, of course, is converted into phosphoric acid—by oxidation to phosphorus pentoxide and hydration to acid.

Last year 455,000 tons (100% basis) of phosphoric acid was made from phosphorus, and a similar amount was obtained by the wet process. Similar in amounts, they were nevertheless dissimilar in application. About ¾ of the acid made from phosphorus went into chemical uses; the comparable percentage for wet-process acid was only about 20%. Practically all food-grade and pharmaceutical-grade phosphoric acid is derived from the element; the post-war surge of antibiotics and antimalarials has boosted the market for high-purity grades. The bulk of wet-process acid, on the other hand, goes into superphosphates fertilizer and technical-grade products.

Outlets for food-grade phosphoric and its salts are manifold: soft drinks, baking powder, dentifrices, manufacture of gelatin and yeast, and silage preservation are major outlets. Pharmaceutical-grade material is used in the processing of streptomycin and penicillin.

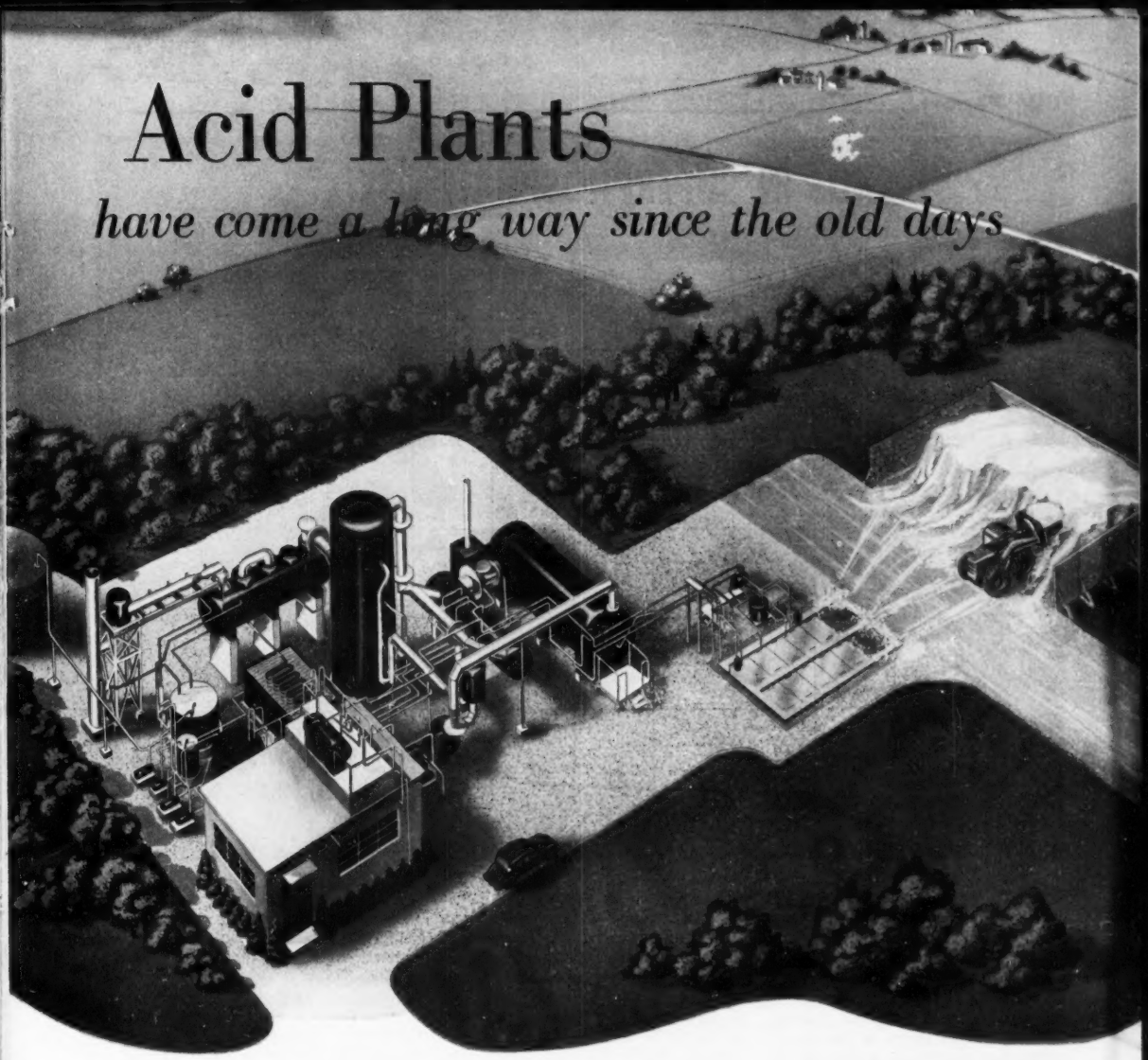
But the technical grade, with which the wet-process material is competitive, accounts for the greater volume of acid sold. From this grade stem the widely used phosphates and polyphosphates. Substantial quantities are also needed as catalyst in two alkylation processes: manufacture of high octane gasoline, and of alkylated aromatics for synthetic detergents.

Promising and potentially more important is the field of metal treatment and processing. Its use in the pickling of stainless steel and for bright dipping of aluminum has risen sharply in recent years. But rustproofing, surface bonding of paint and metal extrusion are the three largest applications of phosphoric acid in the treatment of metals. This business, still young, is already estimated at $25 million a year.*

* Firms involved in phosphate coatings include Heintz Mfg. Co., Pennsylvania Salt Mfg. Co., Parker Rustproofing, American Chemical Paint, Neilson Chemical and Oakite Products.

Acid Plants

have come a long way since the old days



At the turn of the century, virtually all sulfuric acid was made by the chamber process. A 50-ton per-day unit was a large installation and chamber acid had a maximum strength of 77 per cent.

Today's contact acid plants are a far cry from the old days. Units are modern and functional in design—efficient and reliable in operation. Single units producing up to 500 tons per day are becoming commonplace and acid of any strength is produced.

Chemico is responsible for many of the developments that account for this vast improvement. Chemico pioneered and pointed the way in the use of—

a. Pre-molten brimstone and spray sulfur burners

b. Pre-dried air for combustion of sulfur

c. Centrifugal blowers and pressure sulfur furnaces

d. Boilers to utilize waste heat of sulfur combustion

e. Economizers to utilize converter heat

f. Highly efficient, non-poisonable vanadium catalyst

g. Quench converters for high catalytic conversion

h. Acid wastes for production of fresh acid

These advances resulted in simpler, more reliable plants—higher efficiency—lower investment—conservation of manpower. Today more than ever, Chemico designed and built plants are profitable investments.

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Chemico plants are profitable investments

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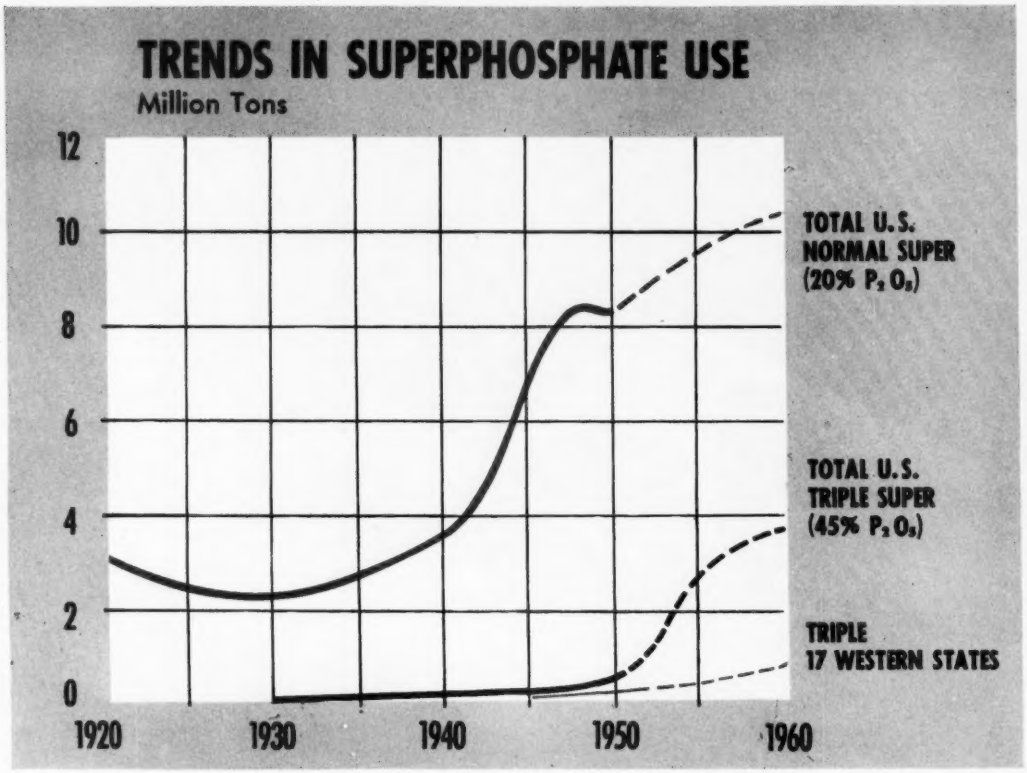


Some of the heavy metal phosphates as well as the acid are utilized in metal treatment. Zinc phosphate is probably the largest, although proponents of iron phosphate challenge its position. Of more recent origin is the use of ammonium phosphate, which has the advantage of leaving no metal deposit after heating.

Sufuric Rival: But phosphoric acid makers have their sights upon a far bigger, though more distant, objective —some practical method of using phosphoric for pickling and descaling ordinary steel and iron. This huge market is now the near exclusive domain of sulfuric acid because of its lower cost.

A serious sulfuric drawback is its corrosiveness. Some of the metal is lost, and the metal surface often requires a phosphatizing coating afterwards.

But if phosphoric acid could be regenerated and recovered economically, it might be able to give sulfuric a run for its money. The Permutit Co. thinks it has the answer with a way to regenerate the spent phosphoric by means of ion exchange. This system has been making some headway since it was introduced about two years ago, though whether it needs further improvement or is the last word remains to be seen. In any case, the potential size of the target will sustain interest at a high pitch.

Compound Interest: Some of the less well-known salts of phosphoric acid are due for more attention.

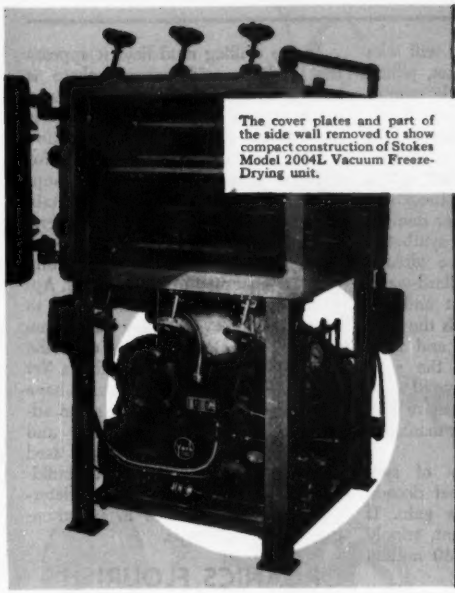
Magnesium phosphate, a comparative newcomer, looks good for a spurt because it makes a satisfactory mold release for aluminum castings. Ammonium phosphate is well-established as a flame retardant for wood and textiles, is also used to control evenness of wool dyeing.

But of them all, possibly no other phosphate has a better chance for big-time success in the next five years than the dicalcium salt, which has been creating a niche for itself as an animal feed supplement. To make progress it will have to compete with such products as colloidal phosphate rock and steamed bone meal, both used for many years. Advantages claimed for the dicalcium phosphate: greater uniformity of product and supply.

American Agricultural is the important factor in this market, but International Minerals will achieve comparable rank when its new plant at Bonnie, Fla., is completed.

Two new producers will be operating within a year, will each introduce some innovations in its manufacture. The one, Shea Chemical, will make it from its own elemental phosphorus. The other, Texas City Chemicals, will treat Florida phosphate rock with spent sulfuric acid obtained from chemical operations of Carbide and Carbon's neighboring plant.

Sodium on Top: Regardless of the hoped-for bonanzas, the fortunes for phosphorus producers will remain most closely linked to the sodium phosphates and their complex offspring, the polyphosphates. (Simple phosphates are converted to the poly compounds by heating properly proportioned mixtures, and cooling under carefully controlled conditions.) The phosphates themselves, readily made



The cover plates and part of the side wall removed to show compact construction of Stokes Model 2004L Vacuum Freeze-Drying unit.

Processing ACTH in Stokes Model 2004L Vacuum Freeze-Drying chambers at Armour Laboratories, Chicago, Ill.

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by neutralizing the acid with soda ash or caustic soda, are, depending on proportions used, mono-, di-, or tri- in order of rising alkalinity. Disodium is by far the largest in terms of production, since most of it (about 80%) is converted to tripoly. It has minor uses in pharmaceuticals manufacture, dyestuffs application, water softening, cheese processing, evaporated milk and weighting of silk.

Monosodium is also used similarly for pharmaceuticals, dyestuffs, and water softening; and also as an acidic detergent.

Trisodium (TSP) is predominantly used as a powerful and strongly alkaline detergent.

Disodium has grown considerably in the last three years, but most of the production is captive since it is used to make tripoly, whose phenomenal growth has carried disodium along with it.

Balancing disodium's rise is trisodium's decline. Ten years ago a leading product, it has now been largely supplanted by the polyphosphates. One producer, Du Pont, dropped out last year. It seems likely that TSP, because of its low cost, will retain its present market volume. Nevertheless, it has lost considerable ground in the last decade to the polyphosphates, which surpass it in at least four ways: detergency, water softening, lower alkalinity, and sequestering ability. Among the polyphosphates are sodium tripoly, (STP), tetrasodium pyrophosphate (TSPP), sodium acid pyrophosphate, and sodium hexametaphosphate (hexamet).

A Key for Poly: Its success as a builder for packaged synthetic detergents has pushed sodium tripoly well into the lead among the polyphosphates. Production was about 620 million lbs. last year, and should in all probability reach 650-700 million lbs. by the end of 1952.

Though tripoly has made remarkable gains in the past five years, it is still virtually a pawn in the market struggle between synthetics and soap.

Polyphosphate producers are consequently seeking answers to two vital questions:

1. How far and how fast will the synthetics climb?

2. Will future synthetic formulation continue to use as much tripoly (about 40%) as they now do?

Synthetics Rise Slows: Most estimates foresee a further rise in synthetics but at a slower rate of increase than heretofore. Today synthetics hold about 40% of the combined soap-synthetics business, but it seems likely that by 1962 the synthetics will take over 50%-55% of the market, which should by then total a little over 5 billion lbs. compared to about 4 billion lbs. today. The actual figures will certainly depend on comparative prices; and from that standpoint soap's position is strengthened by the lower cost of fats and oils. Another damper on unbridled enthusiasm for synthetics is the fact that they have already made their biggest gains in hard-water areas such as the Midwest and the West Coast. A sterner test is the soft-water areas of the South and New England, where much of the sales campaign will have to be waged from here on. If synthetics can snare half of these markets, many sales managers will be well satisfied.

A conservative estimate of synthetics growth over the next decade is a 100 million lb.-a-year gain. If formulations remain constant, tripoly will therefore gain about 40 million lbs. a year.

This assumption is far from certain. Price competition or other factors may cut down on the proportion of tripoly used. Growth of liquid detergents, which use builders only to a limited extent, at the expense of solid formulations may also make inroads on this market. Tripoly producers are not unduly perturbed, however, for they foresee higher sales of industrial detergents and other uses for tripoly.

One of these promising new uses is the removal of pitch from wood pulp to make a lighter-colored paper stock. This field is contested with some of the other polyphosphates, notably hexamet.

Others Move Up: The tonnage of hexamet is well below that of tripoly, but its growth during recent years has been steady and the future looks bright. Already the biggest outlet, and still potentially the best bet for the future, is its use in automatic dishwashing, a market that is well below saturation. Other opportunities: softening and conditioning of boiler water, various applications in textile processing and leather manufacture.

On the basis of size, tetrasodium pyrophosphate ranks next to tripoly, but it hasn't reached the heights predicted for it before tripoly appeared on the scene. TSPP is the leading builder in soap formulations. What tripoly stands to lose in the soap-synthetic tussle, TSPP hence stands to gain.

Other uses also take a share of TSPP. One is in the polymerization of synthetic rubber; a larger is in formulation of drilling mud.

In the drilling mud field it appears that sodium acid pyrophosphate is gaining at the expense of TSPP, since many experts think that the former is more stable to heat. This application is now probably the major one for sodium acid plyrophosphate, supplanting in tonnage the long-established, steady use in baking powder.

Within the last year, Westvaco especially has been actively promoting the corresponding potassium salts. Applications for these usually have to be pinpointed where they have some definite edge in properties over the more economical sodium products. Yet the higher-priced potassium salts have made their way because of some advantage in sequestering ability and higher solubility. They are now used as clarifiers in liquid soaps, as builders in some liquid synthetic detergent formulations, and in premium-grade soap shampoos.

ORGANICS FLOURISH

Organics Are Elemental's: Although competition for the business in inorganic phosphates and polyphosphates between furnace and wet processors may quicken, the elemental phosphorus producers have at least one market to themselves: organic derivatives.

The flourishing organic compounds are made from phosphorus chlorides, pentoxide and sulfides. All of these require the element in their manufacture. The most important of these intermediate compounds is the trichloride, starting point for the oxychloride and the pentachloride. These intermediates are the key building blocks for the growing array of organic phosphorus compounds now proving useful in such diverse fields as plasticizers, insecticides, lubricants—in short, a gamut of chemical applications.

Almost all of the elemental producers make at least the intermediates, and others go beyond that stage to make some of the finished products.

Westvaco is an exception, since these activities are handled by its associate in the Food Machinery organization—Ohio-Apex, whose plant at Nitro, W.Va., makes not only the intermediates, but also ranks among the larger plasticizer producers. Monsanto makes the chloride and oxychloride at Monsanto, Ill., finished organic products at St. Louis, Nitro, and Anniston. Most of Victor's sizable output comes from Chicago Heights, Ill. Virginia-Carolina is active in both intermediates and finished products. Oldbury makes its intermediates mostly for sale to others.

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Many other firms, not phosphorus producers themselves, buy the element or intermediates and convert them to organic phosphorus compounds. Research in this field is ebullient with activity, and new developments are a regular and frequent occurrence.

Probably the largest outlet for organic phosphorus products is in plasticizers. The triple key to their popularity: fire resistance, high compatibility, good plasticizing properties. Chief among the plasticizers are two aryl phosphates—tricresyl phosphate (about 15 million lbs. last year) and triphenyl phosphate (about 6 million lbs.). Both are widely employed in cellulosics, and tricresyl is also used in combination with the dioctyl phthalates for vinyls. Demand for the alkyl phosphates (some 10 million lbs. last year) is getting livelier. To help meet it, Carbide and Carbon earlier this year doubled its capacity for dioctyl phosphate, whose utility is further enhanced because it imparts low-temperature flexibility to vinyls.

Some of the organic phosphate esters, and to a smaller degree the newly-introduced alkyl phosphites, serve many purposes within and about internal-combustion engines, ranging from heavy-duty vehicles to aviation jets.

Tricresyl phosphate has threefold value: in hydraulic fluids, as a synthetic lubricant additive for jet engines, and—now coming up—as a scavenging agent to minimize deposition of lead inside the cylinders. Heavy-duty lubricants require several kinds of phosphorus compounds; one type is addition compounds of phosphorus sulfides and organic amines. The alkyl phosphites, which have been aggressively promoted by Victor and Virginia-Carolina, show promise in that field as well.

The phosphites are also used in anti-foams and anti-oxidants. If their price can be brought to a competitive level, they may find their largest outlet in fire-retardant plastics, of which Victor's Phoresin is a leading example.

Insecticides provide another promising market for phosphorus compounds—especially the organic pyrophosphates and thiophosphates. Outstanding at present are tetraethyl pyrophosphate, hexaethyl pyrophosphate and parathion (an alkyl nitrophenyl thiophosphate). The pyrophosphates can be made from triethyl phosphate and phosphorus oxychloride; parathion is derived from thiophosphoryl chloride. Although these insecticides are toxic to warm-blooded animals, they are safe and highly effective when applied by trained personnel. Moreover, since they hydrolyze readily, they leave a minimum of residual toxicity. Nevertheless, hazards attend their use, and further research and testing is under way on some closely related products to see if these disabilities can be overcome.

The first systemic insecticide to win U.S. Department of Agriculture approval is also a phosphorus product. Ushered into use about two months ago under the name of Systox by Pittsburgh Coke and Chemical Co., the product, originally developed in Germany, is a thiophosphate ester. It is expected to find widespread use for aphid and mite control. Monsanto has a similar product, octamethyl pyrophosphoramide, which now awaits the USDA go-ahead.

Teeming activity over the entire area of organic phosphorus compounds, together with the inherent versatility of the element, makes it clear that this lucrative lode has only been scratched. Some typical new developments:

- Dialkyl phosphates as anti-static agents in textiles.
- Organic phosphates for surface-active and flotation agents.
- Textile flame retardants which are effective, withstand laundering, and yet do not interfere with normal textile hand and drape.

Interest in the phosphonic and phosphinic acids is gaining momentum, although the volume is still small. At least two petroleum refiners are doing investigations on their own, besides the expected activities by phosphorus producers.

LOOKING FOR MORE

Sooner or Later: The time element may have an important bearing on the future use pattern of phosphorus and its compounds. Within the next two years especially, a great deal will depend on how fast industrial demand can take up the 70,000 tons of added phosphorus capacity that will be in operation late this fall. That's a 30% increase since last year—and that's a lot of phosphorus.

If demand is to be maintained, the market for polyphosphate represented by detergents must show strength, dicalcium phosphate for animal feed supplements must make quick and substantial progress, and some of the newer potentialities for phosphorus compounds must be realized.

Looking at the prospects conservatively, it is not unlikely that capacity could exceed demand by about 20-30,000 tons, or about 10% of capacity. Producers face this prospect, however, with serenity. For one thing, furnaces are not meant to be operated at capacity—as many have had to be operated since 1942. The heavy wear and tear of constant use leads to faster depreciation and hikes the cost of production. Producers will now likely have a breathing spell, opportunities to stagger operation of several furnaces, and a chance to take advantage of lower rates for off-season power.

And producers can, if they're so inclined, move in on the superphosphate fertilizer business, turning the tables, as it were, on wet processors who are now competing for chemical business. Here the best long-term opportunity is afforded the Western producers of elemental phosphorus, who are well situated to snare a good part of the huge and largely unsatisfied demand in the 17 Westernmost states. Realization of this possibility would probably require setting up an acid plant adjacent to the furnaces.

But even at best, the fertilizer business is no sinecure. The business is highly competitive, and superphosphate made from furnace-based phosphoric would have some rugged competition from wet processors, who are losing no time in expanding. In the West they can use by-product sulfuric, and can recover sulfur from refinery sour gas.

However, compared to the total demand in the Western states, wet-process fertilizer capacity is limited by the supply of such low-cost acid. Ample opportunity is thus afforded to phosphorus makers to meet the unsatisfied demand with element-derived acid. Their chances for success may be improved if they concentrate on high-grade mixed fertilizer containing the optimum proportions of phosphorus, nitrogen, and potassium. The westward movement of ammonia plants and potash deposits in Wendover, Utah, are factors enabling ventures in this direction.

Fundamentally Sound: With fertilizer business as a cushion and the rising demand for phosphorus products, the industry is clearly on a sound basis and will become still more robust. It will be interesting to watch, and rewarding to follow, as potential demands are translated into realities; and to see whether furnace producers or wet processors forge ahead faster in the manufacture of phosphates and polyphosphates.

Whatever the outcome, the Western producers by next year will be glad they expanded this year; and the year after that, expansion talk will be rife again.

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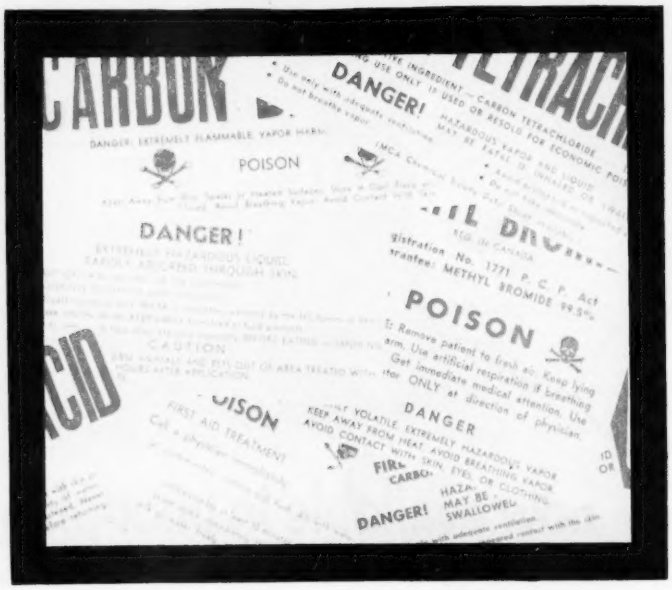


CHEMICAL LABELS: An industry committee tries to bridge a sea of confusion.

No Welter of Warnings

In Trenton, N.J., this week, the Bureau of Adult and Industrial Health is busily preparing a set of recommendations for submission to the State Commissioner of Health. Subject: a set of standards for the labeling of chemicals in the state of New Jersey. Similar work is going on in Ohio, Rhode Island, New York, and several other states. The common demominator for all these activities is the quiet influence of a Manufacturing Chemists' Association committee which is trying against odds to keep the regulations uniform.

Every chemical manufacturer whose products are used on a national, or even a regional, scale has a stake in the successful outcome of this venture. In our highly regulated era, when a businessman's every move seems to be subject to one law or another, it may come as a surprise to learn that there are virtually no regulations telling the chemical industry how to label its more dangerous products.

Federal action in this sphere has been remarkably limited. In the early '30's the major chemical producers entered into a series of voluntary agreements with the government concerning the handling of certain chemicals with toxic fumes. These comprise the familiar "Surgeon General's Agreements." A few years earlier, the Federal Caustic Poison Act had been passed, covering mainly the labeling of strong acids and alkalis, and in 1947 Congress enacted the Federal Insecticide, Fungicide and Rodenticide Act.

State Action: But except for these materials and those which are affected by the Pure Food and Drug Act or the regulations of the ICC covering flammable and oxidizing materials, the great bulk of chemical products has been free of any U.S. laws. As could be expected, the state governments have been moving slowly into this vacuum. The first to do so was California, which began to formulate a code covering all chemicals in 1944. By a fortunate coincidence, that same year the MCA had established its Labels and Precautionary Information Committee. The original purpose of this LAPIC group was to coordinate and expand the labelling activities of the MCA members, but it immediately saw that its efforts would be pointless if they ran contradictory to such standards as California was establishing.

Moreover, these state rulings are aimed primarily at the local distributing concerns that repackage chemicals into the smaller containers which are finally used in the household or on the

farm. This is also the level where the greatest danger of accidental injuries or fatalities exists, and association recommendations from the MCA would have practically no effect on these outlets.

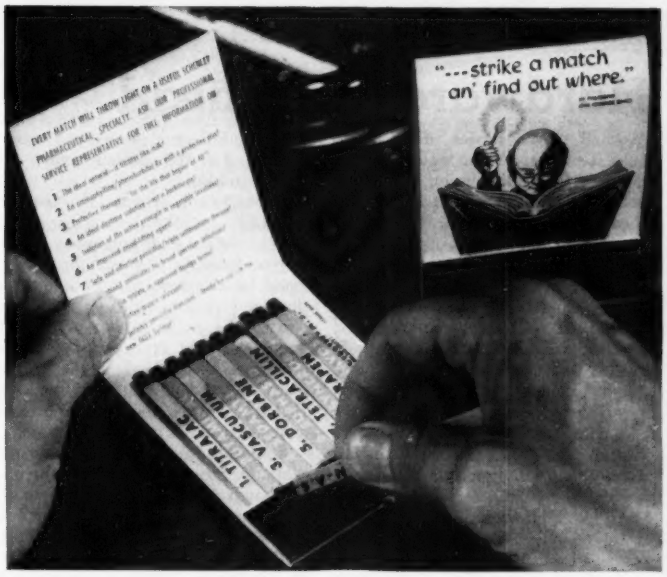
Agreeing in general, therefore, with what California was doing, the LAPIC members worked closely with the state authorities. The result was a set of regulations which followed closely on those already established in the industry. Other states which have followed California's lead are Oregon, Illinois, and the territory of Hawaii.

Potential Trouble: The LAPIC has not always been 100% successful, however. Massachusetts, for instance, has passed a law recently which sets up labeling rules for selected chemicals—not all of which are in accordance with the LAPIC standards. As a consequence, additional labels must be applied by manufacturers who expect to ship such chemicals as carbon tetrachloride into the Bay State.

The committee has not, however, followed a program of urging new regulations on the vast majority of states which today do not carry any labeling laws on their statute books. Instead, it waits till it hears that a given state is studying the problem, and then moves in to present its case. As a matter of policy, it recommends that the legislature pass only an "enabling act" permitting the state health or labor departments to set up the exact regulations. This allows for greater flexibility and avoids the Massachusetts situation where the state bureau is unwilling to go back to the legislature for such a trifling amendment as a change in the type size of a warning label.

Label Bible: Cornerstone for this edifice of coordinated state regulations is an 86-page MCA booklet identified as Manual L-1. The bulk of the pages are devoted to recommended labels for over 200 common chemicals, but the heart of the book is in the front section which outlines the standardized nomenclature from which the labels were derived. This allows a manufacturer to prepare a suitable label for any new product—once he has established its main hazardous characteristics.

The first general grouping, for instance, is into three degrees of hazard severity. These are "Danger!", "Warn-



Luciferous Pharmacopoeia

ON THE THEORY that those doctors and druggists who don't smoke at least have an occasion to light bonfires, the sales department of Schenley Laboratories, Inc., has come up with this king-size matchbook designed to spread light on eleven of Schenley's ethical drug products. The idea is that each time the doctor strikes a match he is supposed to read the correspondingly numbered sales legend.

ing!", and "Caution!" The next step is to indicate the "class" of hazard—e.g., flammable liquid, skin irritant, internally toxic, etc. This leads into a statement on precautionary measures and action to be taken in case of exposure.

All of this information is readily convertible into state-bureau directives—in fact, the Oregon law merely refers its citizens to the MCA booklet.

The entire industry can be thankful that there will probably be more states like Oregon than like Massachusetts.

APC'S AARON: He's gambling on a plastic gadget to catch consumer recognition.

Hardware Beachhead

A small plastic device, designed to hold screws in plaster walls, may be the first faint glimmering of a sales policy switch on the part of a major chemical company.

The American Plastics Corp. is a 98%-owned subsidiary of the Heyden Chemical Corp. and one of the oldest plastics molders in the business. Ever since, 1931, the offspring has followed the lead of its parent in its attitude toward direct sales to the consuming public. Industry observers are consequently more than a little bit curious about this week's news that American Plastics is, for the first time, bringing out a product designed for the householder.

Although Heyden denies that there is any connection between its own plans and those of its subsidiary, there is no denying that Heyden has purposely avoided the bittersweet pleasures of vying for the retail buyer's dollar. Over the years, for instance, it has resisted the temptation to bring its own aspirin and penicillin onto the American retail market—even though it has been basic in both items. Similarly, American Plastics has limited itself to industrial items and casein plastics for the button and ornamental trades.

Babes in the Woods: The man responsible for the launching of the new hardware line, gregarious Martin Aaron, formerly technical purchasing agent for Heyden and now vice president and general manager of American Plastics, makes no bones about his company's lack of experience in the consumer field. "We've got a lot to learn," he admits, "But we're finding that it's not completely incomprehensible once we've gotten into it."

Stepping gingerly into the strange waters, Aaron is enlisting the help of old hands in the game. He is signing contracts with established manufacturers' sales agents who have contacts in the distribution channels leading to the dimestore, drugstore, and hardware outlets. But these agents will not buy and resell American Plastics' products. Rather, the manufacturer will ship directly to the wholesaler or retailer—with a percentage commission for the responsible agent involved. This will carry the American Plastics name all the way to the householder.

It Flows: The item which Aaron has picked to initiate his marketing experiment is a small plastic tapered-cylinder object which is designed to compete with expansion screws, toggle-bolts, and lead anchors in attaching fixtures to plaster, plywood, or plasterboard walls. The secret of "Plastikhold" lies in the flow characteristics of its special acetate-butyrate resin component. This prevents it from cracking the plaster and also allows the protruding end—behind thin walls—to be pulled up tight, forming the equivalent of a plastic rivet. Patents are pending on the device.

American Plastics is joining good company in making its decision to go retail. Most of the other large plastic producers—such as Du Pont and Monsanto—have products which carry the manufacturer's trademark. This gives the company's entire product line the added weight of widespread public recognition and acceptance. Now American Plastics and Heyden are also in line to grab a piece of that valuable asset.

Green Light

The rules have now been established for the movement of goods in U. S. trucks across southern Ontario between Buffalo, N.Y., and Detroit, Mich. These regulations implement a bill passed by the provincial legislature last April. The trucks carrying the in-bond freight will have to pay a $7 fee for each trip, each way.

During the war, this movement of goods was allowed by the government as a part of the Canadian war effort. But for the last five years, Ontario has steadfastly refused to allow the privilege again. Even under the new rules, truckers who wish to take advantage of the short route will have to fight their way through a snarl of red tape. This includes a special license from the province's Municipal Board and the necessity of buying single-trip permits in advance.

U. S. shippers, however, expect to benefit well by the move. They estimate that they will save as much as $50 a truck on a round-trip—thanks to the 100-mile shorter distance.

•

Family Split: Vinyl chloride products sold by the Monsanto Chemical Co. now carry two trade names. The older one, Ultron, will hereafter refer only to vinyl films and sheetings, while the new name of Opalon will apply to Monsanto's resins and compounds rerived from vinyl chloride. The changed designation is part of a program to simplify material specifications by providing more specific terminology.

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KixMILLER AND MacFARLAND: High hopes for canned heat.

Millions for Defense

Trioxane is now in commercial production by Celanese. It will be used by the army as "canned heat."

But the firm hopes it will find a market in organic syntheses, has extra capacity for that purpose.

It's anhydrous, soluble in a range of solvents, but the present high price tag may prove a big obstacle.

From a laboratory curiosity to a commercial chemical in practically no time at all. That—under the stimulus of a semi-war economy—has been the record posted by the chemical industry for a number of products. Latest to fall into this category is trioxane, the formaldehyde trimer.

Scarcely a year out of the test tube, trioxane is now being produced in a tonnage scale by Celanese Corp. at its new $3.5 million Bishop (Tex.) plant. The big plant was built as a direct result of a Quartermaster Corps request for an improved "canned heat." For security reasons, the QM does not reveal its annual requirements and Celanese is unwilling to discuss production figures. But the new chemical is slated to swell the company's coffers by several million dollars in annual sales.

Moreover, the firm reports that its capacity is more than enough to meet the anticipated needs of the Army. And because the new product evolves anhydrous formaldehyde on the addition of acid, Celanese is painting a rosy future for trioxane as an organic intermediate, has earmarked the extra capacity for that purpose.

Celanese is optimistic despite the compound's selling price—about 50¢ a lb.; corresponding prices for formaldehyde (anhydrous basis) and paraformaldehyde (91% basis) are 11¢ and 12¢ respectively. The fact that trioxane is anhydrous and soluble in a wide variety of solvents makes a strong case for its use in commercial syntheses, but the high price tag is a big obstacle.

While most of the $3.5 million plant investment went for trioxane facilities, the plant will also turn out large quantities of Formcel (formaldehyde in methyl, propyl or butyl alcohol) and paraformaldehyde. In fact, the company calls it the biggest paraformaldehyde plant in the world.

The operation starts with the oxidation of propane and butane. Among the oxidation products is a dilute stream of formaldehyde which is converted to formalin (37% formaldehyde solution) by a simple evaporation. Formalin is then converted to paraformaldehyde, a portion of which is sold. The remainder is converted to trioxane by the Celanese dehydration-trimerization process.

Ready and Willing: During the con-

PRODUCTION . . . . . .

BISHOP PLANT: Extra capacity for a purpose.

version of formaldehyde to trioxane sizable quantities of formaldehyde are given off. That's the principal reason Celanese undertook the job. For the QM approached Du Pont and Heyden as well as Celanese with the production project. And although all three had processes to recover the dilute formaldehyde, only Celanese had a continuous one. Figuring this gave it a slight edge over producers using the batch methods, the firm jumped at the chance.

The QM proposal was made at a joint meeting of the Commercial Chemical Development Association and the Chemical Market Research Association in 1951. Warren Stubblebine, director of QM research and development, told the meeting that the standard material, a hexamine tablet, did a satisfactory heating job but evolved toxic fumes, presented a hazard when used in confined areas. The answer, he said, was commercially obscure trioxane.

Harold KixMiller, general manager of the Celanese Chemical Division, saw dollar signs in the chemical. After selling the higher echelon on the idea, he turned it over to James MacFarland, director of the product development section. Even though the first shipments have already gone out, MacFarland continues to supervise the project.

EQUIPMENT . . . .

Sodium Marbles: To simplify the job of adding metallic sodium to chemical reaction zones, Humphrey-Wilkinson, Inc., (North Haven, Conn.) has added sodium "marbles" to its line of sodium chemicals. The sodium is now offered as spheres (0.5 to 1.0 in. diameter) covered with a film of either white hydrocarbon oil or soda ash. The firm says that the thin coating reduces the handling hazard for the operator, adds that the pelletized sodium is a convenient method for introducing a sodium charge, helps in controlling the reaction. H-W is also marketing a sodium-lead alloy (10% sodium) in the form of shot. Standard size is 0.25 in. but other sizes and composition will be available.

•

Consistency Control: Central Scientific Co. (Chicago) is now pushing applications for its Cenco-Bostwick Consistometer among the chemical process industries. The instrument measures consistency by timing the flow of a viscous liquid through a trough. Developed by the U.S.D.A. for the food industry, the instrument should have applications in many industries that handle viscous materials, says Central Scientific.

•

Level Detector: The General Electric Co. (Schenectady, N.Y.) now reports it has a new electrical system for sewage and water level control and indication. Aimed for use in wet walls, sumps and other wet reservoirs, the system will control flow through pumps or can be hooked up to alarm systems. A temperature-sensitive element is wrapped with a resistance heater and hermetically sealed in a stainless steel tube. In air, the resistance element is low because the heater keeps the detector hot. When the system comes in contact with water, however, the temperature rises and the resistance climbs rapidly. That triggers a remote relay which can be hooked to control or indicating elements. G.E. says the system is self-cleaning, will not corrode, should be

specially suitable for unattended stations.

•

Roller Turntable: Lamson Corp. (Syracuse, New York) is now marketing a roller turntable that can be adapted into roller gravity conveyor systems. The turntable can be locked into position to permit the flow of packages in one direction, or it can change direction of packages being processed. Lamson figures it adds versatility to any type conveyor system.

•

Lighter Valve: Fabricated of stainless steel throughout, a plug valve has just been introduced by the Alloys Products Corp. (Waukesha, Wisconsin). President Walter Wachowitz claims that improved interior design has halved the weight, while retaining the strength and resistance of conventional valves. Because it will simplify washing, lifting and positioning, says Wachowitz, the valve should mean savings in plants where the lines must be taken apart and cleaned frequently.

•

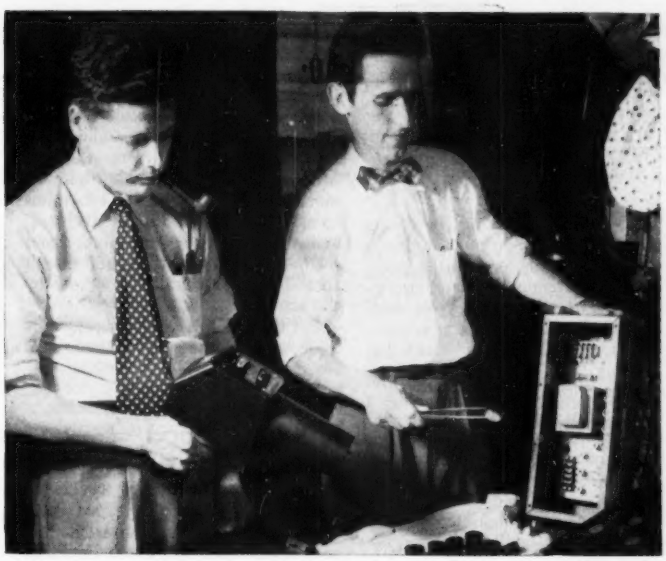
Plate Restoring: Engineers at Sam Tour & Co. (New York City) have developed a method for restoring information contained on corroded plates on boilers and other pieces of power equipment. The firm points out that the information, frequently required for renewal of licenses or insurance, may become unreadable after the equipment has been in place for a few years. In the method, the surface is cleaned with a solvent, then treated with acid. The success of the method is due to the special response of cold-worked steel to acid etching.

•

New Distributor: The Union Industrial Corporation (Carlsbad, N.M.) and Worthington Corp. (Harrison, N.J.) have signed an agreement making UIC distributor for Worthington Multi-V-Drives and Allspeed Selectors in three counties in New Mexico.

•

Proportioning Pump: Designed for accurate feeding of chemicals in applications requiring low capacity and medium pressure, a proportioning pump has just been introduced by Proportioneers, Inc. (Providence, R.I.). The standard model has a capacity range of 1 to 10 gph., discharge pressures up to 650 psig. The firm is also supplying model with a range of 0.5 to 5 gph. at the same discharge pressure. Weighing less than 100 lbs., the pump is said to have a long life, be cheap to maintain.



Chemical Mechanics

AFTER SEVERAL YEARS of experimenting on radioactive substances, John Yeiser (left) and Mike Simonton have formed Hazatrol, Inc., (Richmond, Calif.) to apply their results to process equipment. Their first item is an elevator control device. A modified Geiger cell attached to the elevator spots a radium capsule on the shaft, actuates the stopping mechanism. They say it will stop a moving platform within 0.05 in. of the floor.

SPRAY-ON SUN-SHIELD: Toward tempered tanning, chemical filters.

A Screen for Sol

Sun protectant makers credit this year's blistering summer with a surge in demand.

Early postwar appeal of chemical sun-screens, helped by protection-wise GI's, was high, but it appears to have temporarily dipped.

Organic ultraviolet ray filters are the key to these compounds that have superseded the old fat-and-essential oils preparations.

The beaches are jammed, the resorts are bulging, the golf courses are crowded. It's the torrid sort of summer that kills the joy of life for most people —but it's a darn nice break for makers of sunburn preventives. For a lot of folks will be out soaking up the sun, and spending money to keep a handsome bronze from turning into a painful pink.

Suntan lotion formulators are frankly pleased with the good weather. Percentagewise, the burn preventives market has gone down in recent years. But according to several recent nationwide surveys by leading women's magazines*, business is on the upswing after a slight decline in the past year or two.

The mid-forties consumption of burn preventives could in some degree be ascribed to the military. Army Air Force research, aimed at preventing painful burning of personnel in desert and coastal stations, probed the problems of suntanning and sunburning. And the formulations they devised, based on phenyl salicylate in creams, were effective enough to make the men using them want similar protection when they returned to civil life.

Guard Up: Although service life did bring sunburn preventives to the attention of many, such lotions are by no means spanking new, nor are so-called sun-screens used in them. That compounds like quinine, aesculin, phenyl salicylate (salol) filtered out ultraviolet rays was recognized long before the war. There was some doubt, however, late as the mid-thirties, as to whether or not sun-screens were worth putting in.

More and later research proved the value of light-filtering compounds.

Briefly, research has shown that it is ultraviolet energy in 2900-3200 (Angstrom units) wave lengths that causes painful burning. Energy of wave lengths 3300-3650 produce tanning without burning. The burning effect, erythema, is due to the increased amount of blood at the skin surface; tanning appears to be due to formation of a natural skin pigment, melanin. A good sun screen (and not just an opaque pigment that simply blocks off all light) then, is one which will block the passage of light in the 2900-3200 Angstrom range, yet permit passage of the 3300-3650 rays.

In addition to the compounds long known to be suitable, screening agents include substituted lactones, such as umbelliferone, β-umbelliferone acetic acid, daphnetin, *P*-aminobenzoic acid, and a host of others. Representative suntan preparations on the market contain propylene glycol and *P*-aminobenzoate (J. B. Williams' high-selling Skol); methyl umbelliferone and benzyl cinnamate (Perfection Sunburn lotion); dipropylene glycol salicylate (Dorothy Gray's sun lotion). At that, not all of the presently sold compounds contain a specific screen; Spray Tan, Barro Industries' product, is one such.

Preparation Problems: As these suntan compounds have evolved from simple combinations of fatty oils and essential oils, difficulties involving sun-screening agents had to be ironed out.

A compound which is an effective screen by itself may not work well in the commonly used oil or alcohol or cream base; this must be checked. Moreover, the preparation must be non-toxic, non-irritating, and harmless to clothing. It should have good storage stability, low water solubility, and relatively low volatility. In addition, it should not be readily absorbed by the skin.

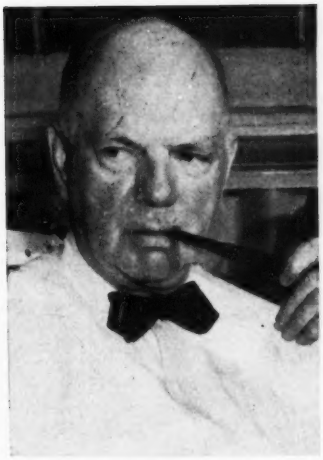
But these problems have been overcome, and present sales of suntan aids are estimated at several million dollars yearly.

It Looks Good

"America has gone typically hog-wild in promoting chlorophyll. Trying to ride on the skirts of really good chlorophyll products are a lot of spurious ones. When these are weeded out . . . the boom will seem to be over. But high chlorophyll sales will persist indefinitely . . . will rise above even the present boom proportions."

That's the way the chlorophyll (or more accurately, chlorophyllin) situation looks to W. H. Wheeler, whose Airkem, Inc. (New York maker of Airwick) was probably the first to

* *The Women's Home Companion* study, "Cosmetics in Use," prepared by the Research Dept., Crowell-Collier Pub. Co.; *Good Housekeeping's* "Beauty Secrets," and *Cosmopolitan's* "Survey of Beauty."



WHEELER ON CHLOROPHYLL: The boom should lead to a boom.

promote and make use of the deodorant properties of chlorophyll.

Despite Wheeler's distress at the over-ballyhooing of the current wonder ingredient, he is confident that the most significant applications of chlorophyll haven't been plumbed yet.

Chlorophyll, employed in de-scenting consumer goods, will prove to be a tremendous factor in industry, Wheeler feels. With an eye toward diversified manufacture, Airkem has pushed chlorophyll research the past ten years, has made and examined many of the newly introduced products. Its conclusion: Applications in toothpastes, body deodorants and the like will be only a small part of the field. The best bets, Wheeler thinks, are exemplified by the Airkem-Allen Industries (Detroit, Mich.) work in removing the odor from rubber underrug pads, and in deodorizing cotton linters used in mattress manufacture.

Imported Extracts: Wheeler says he's using the same sort of chlorophyllins used in other products, soluble copper forms. But where most present consumers require a carefully purified product, Airkem employs a grade that includes some other plant extractives, which Airkem has found of value in room freshening. The company isn't competing for the short U.S. supply of chlorophyll; for the past three years it has purchased its requirements exclusively from an English firm, William Ransom & Sons.

Most disturbing, Wheeler finds, are the formulators who add a trace of chlorophyll to their products, then claim almost magical properties for them. He thinks the claims are frequently without any valid supporting evidence—and it is the conceivable rebound of doubt about *all* chlorophyll products that bothers him.

Chlorophyll has been Wheeler's baby for the past dozen years. He's raised it to the extent that his Airwick is being used in most of the world outside the Iron Curtain, and he doesn't want to see it cut down in its adolescence.

Self Policing

Maybe it's the wrong time of year to be thinking about snow, but the aerosol trade is doing just that. Its aim: To give the customer a fair deal.

With the introduction of the aerosol-dispensed artificial snow last year, additional attention was turned to a problem that has been facing aerosol makers for some time: Just what constitutes a filled aerosol container. Buyers of artificial snow occasionally discovered that there was hardly enough material in some cans to cover a tree, and their understandable complaints have spurred the industry into doing something about it.

At the recent meeting of the Chemical Specialties Manufacturers Association in Boston, the aerosol wing thrashed the problem out, decided to adopt a resolution for artificial snow packagers: The standard 12-oz (fluid) containers must be filled with not less than 12-oz by weight of pressurized artificial snow, the standard 6-oz can not less than 6-oz.

The move should do much to raise the consumer's faith in aerosols of all sorts. For there is a tendency to buy by can size, and assume the can is full; a deceptively filled container certainly won't make for repeat customers.

It is no secret in the industry that the Federal Trade Commission has been investigating the matter of possible unfair trade practices engendered by deceptively filled cans. And the best way to avoid interference from a Government agency is to do an effective job of self-policing one's own industry.

The resolution adopted is similar to the ones the industry previously agreed upon to cover insecticides and room deodorants, resolutions that contributed greatly to stabilizing the weights of fill of these products.

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X-Ray Fixer: A new liquid fixer chemical for X-ray photographs has been introduced by General Electric Co. The new compound is said to be as stainless as dry powders and more economical.

•

On the Move: The swarm of army worms, which the USDA has warned about for some time, has moved into lower counties of Wisconsin. Toxaphene is being used extensively to combat this pest.

Take It Easy

A. H. MOSEMAN has problems: As head of the U.S. Dept. of Agriculture soil scientists testing the new soil conditioners, he's been snowed under with inquiries about the soil builders. As reported (*CW Newsletter July 26*), the Dept. now suggests that conditioners be used cautiously until the individual can observe their value on his soil. That's about the best Moseman can do; although the public looks to the USDA for guidance, the Bureau has no responsibility in cases like this.

Deodorizing Cleanser: Cameo Corp., (Chicago), maker of an abrasive household cleanser, is now including 0.3% chlorophyll in its formulation, has changed its scent from lemon to mint.

•

New Soil Conditioner: Soil Conditioner Corp. (Chicago) is one of the latest to enter the soil conditioning field, with its WonderSoil, sold in most dime stores, at 98¢ per pint.

•

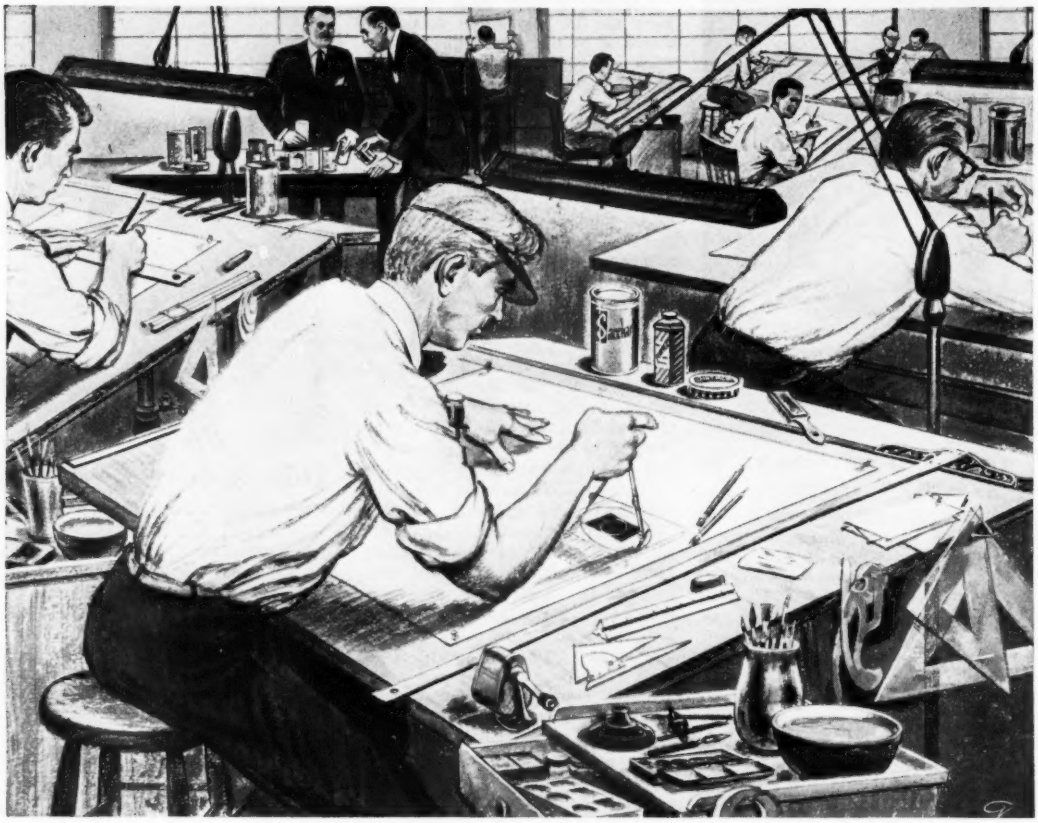
New Plant: In Portsmouth, Va., construction has begun on a 24,000 sq. ft. plant of the Murro Chemical Co. The single story facilities will be used for the manufacture of powdered hand soaps, and other cleaning compounds.

•

Arner Output Up: Output for the Arner Co., Buffalo, N.Y., pharmaceutical manufacturer, is some 22% above the first-half production of 1951 for the home plant; Canadian plant reports a 47% increase.

•

Detergent for Al: New cleaner for aluminum, anodized aluminum and magnesium parts is Kelite PWB No. 81, a detergent powder. It is compounded by Kelite Products, Inc. (Los Angeles).



He's got designs for business!

Here's a man you rarely see, but who, nevertheless, is very important to you. He's important because the main purpose of his job is to increase *your* business!

He is the Canco development engineer. He knows, as you do, that the right container is the *best* salesman for any product.

His job, and the job of many others like him, is to design and develop *better* containers for products.

His service is one of many that the American Can Company offers to assist you in building your business.

Canco, backed by over half a century of service, will continue to develop better ways of solving its customers' needs.

CONTAINERS - to help people live better

AMERICAN CAN CO.
CANCO
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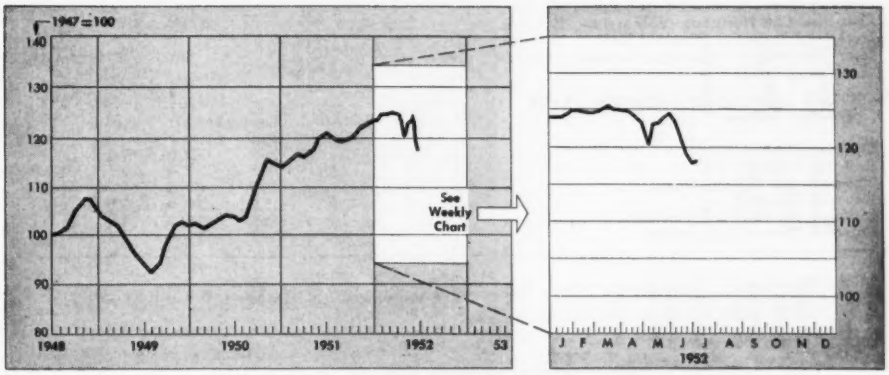
CHICAGO
SAN FRANCISCO
HAMILTON, CANADA

MARKETS . . . . . .



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries

MARKET LETTER

Summer heat, strikes, vacations—these are among the reasons advanced to explain current sluggishness in the nation's chemical market places.

Insecticide sales now are much slower than they were a year ago. And most producers of DDT, BHC, other bug-killers are blaming the hot, dry weather. Here's what happened in the Southwest, for example:

Due to the early drought in Texas, not as much cotton as planned could be planted. And when the rains finally came, farmers couldn't control the insect infestations that developed. Result: Some cotton, other crops were plowed under, lost.

Government experts, through NPA, earlier this year came up with some data on the estimated domestic, export requirements for DDT. They figured that the coming pesticide year (opening October 1) will call for about 150 million pounds.

A glance at DDT yearly production figures for the last three years indicates that NPA's future requirements estimate might not be too far off:

Year	DDT Production
1950	52,400,000 pounds
1951	93,000,000 pounds
1952 (est.)	115,000,000 pounds

While industry would have no difficulty in reaching a production of 150 million pounds of DDT—if it were needed—at least one expert estimates that 1953's output will dip considerably below 100,000,000 pounds. Reason: There'll be a lot of DDT left over from previous production.

The slow movement of cresylic acid is indirectly tied in with the late, but still-felt steel strike. Cresylic goes into resins for can linings, laminates used in automobile manufacture. Both outlets have been curbed, will take time to recover.

Domestic cresylic acid manufacturers' schedules range between $1.20 and $1.35/gallon. Foreign material is lower priced (British about

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK'S Output Index (1947=100)	119.0	118.7	118.7
Chemical Week's Wholesale Price Index (1947=100)	103.1	103.1	106.9
Bituminous Coal Production (daily average, 1000 tons)	1,095.	1,018.	1,692.
Steel Ingot Production (thousand tons)			2,029.
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	250.5	249.6	244.0

MONTHLY INDICATORS—FOREIGN TRADE (Million Dollars)	EXPORTS			IMPORTS		
	May Latest Month	Preceding Month	Year Ago	May Latest Month	Preceding Month	Year Ago
Chemicals, total	69.5	68.2	85.9	19.0	19.0	30.8
Coal Tar Products	3.7	4.6	7.0	0.5	0.3	1.5
Medicinals and Pharmaceuticals	18.3	18.1	26.6	4.4	3.6	2.6
Industrial Chemicals	11.6	11.8	15.2	3.6	5.6	13.4
Fertilizer and Fertilizer Materials	3.5	3.8	4.5	9.8	8.2	12.2
Vegetable Oils and Fats, inedible	4.3	4.8	8.7	7.9	8.3	12.6

80¢, some German at 70¢), but it can't compete with U.S. higher-grade cresylic in many applications.

More good news for sulfur users: By this month industry- (not government) maintained stockpiles will have reached pre-Korea levels. Brimstone stocks as of July 1, 1950 amounted to 2,978,000 tons; now the sulfur piles are about 3,019,000 tons.

Low point in sulfur inventory was reached in January, 1951 when stocks were down to 2,725,000 tons—less than 6 months' supply in terms of consumption.

The action virtually means a general industry increase. For SR 59, GCPR prices are no longer in effect for several firms which have been granted Capehart Amendment increases, and others have adjustments pending.

In dividing the 232,500 long tons of crude sulfur U.S. will export in July 1-Sept. 30 period, the Dept. of Commerce made only slight changes in the quotas allotted to countries during the first half of 1951.

But for the first time, Commerce set country quotas for a division of the 7,500 long tons of refined sulfur to be exported in that period.

In a major revision of its Regulation 1, NPA deleted 30 chemicals or chemical groups from inventory regulation, added 6 others.

The deletions: allethrin, alkyl phenol and derived resins, amyl phenols, butyl phenol, cyclohexylamine, DDT, dichlorobenzene, hexylresorcinol, hydrofluoric acid and derivatives, yellow iron oxide, lead naphthenate, melamine resins and molding powders, naphthenic acid, parachlorophenol, 2,4-D, diphenyl amine, ethylene oxide, ortho phosphoric acid, phenothiazine, phosphorus, Teflon, polyvinylidene chloride and copolymers, resorcinol and derived resins, sebacic acid, sodium chlorate, sulfonated oil, zinc chloride, zinc ammonium chloride, tin chemicals, cellophane.

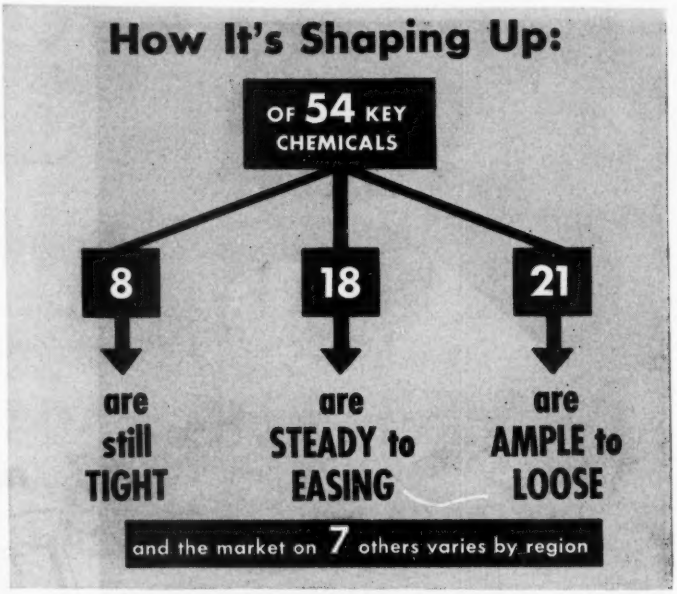
Those added: bis-phenol, granular charcoal, paraphenyl phenol, para-tert-butyl, beryllium compounds, cobalt oxides and hydrides.

New muriate of potash producers can base their ceilings on competitors' current ceiling prices, according to the latest OPS ruling. Previously their ceilings were those set under Supplementary Regulation 59 to General Ceiling Price Regulation.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending July 28, 1952

	Change	New Price		Change	New Price
UP					
Casein, Argentine, acid ppt. gd., 100-lb. lots, ex. dock	$ .0125	$ .1875	Soybean oil, crude, tks., mills	.00375	.1125
DOWN					
DDT, fiber, dms., c.l., srt. egld.	$ .02	$ .38	Tung oil, imp., tank cars	$ .0025	$ .4025
Oiticica oil, dms.	.005	.235			

All prices per pound unless quantity is stated



Easier for Everything

Most chemicals are now in good supply, CW survey of sales managers, purchasing agents shows.

Persistently tight commodities—sulfur, sulfuric acid, chlorine and phthalic anhydride—are now generally available.

The steel strike hadn't hit coal chemicals too severely since consumption as well as production has been down.

Six months' reports showing chemical company sales lagging behind the same period for last year confirm what buyers and sellers have been saying for some months. Sales are off for a variety of reasons: Business generally is dull, smaller inventories are now common, expanded production has eased competition for available materials.

An added factor has been the steel strike which not only has cut the supply of coal chemicals, but has resulted in shutdowns in industries other than steel that are large consumers of all kinds of chemical products.

This altered situation is reflected in decided changes in availability of chemicals throughout the country. The latest CW spot check of sales managers and purchasing agents shows that there now exists a normal market for practically everything, that materials which have been in the tight category for several years are now in good supply. All products, of course, are not plentiful everywhere, but no product was reported short everywhere.

But such commodities as sulfur, sulfuric acid, chlorine and phthalic anhydride—short a few months ago (*CW, April 19*)—are now fairly plentiful. And only eight products were mentioned as being tight in one area that were not listed as more available elsewhere: methylene chloride, carbon tetrachloride, anhydrous ammonia, lithium, azelaic acid, castor oil, coconut oil, paraphenyl phenol. Seven chemicals (perchlorethylene, styrene, benzol, phenol, chlorine, sulfuric acid, and sebacic acid) were reported tight in one area, more available elsewhere. Of the remainder of some 54 chemicals surveyed, all were in either the steady-to-easing or ample-to-loose category.

Bearish Tone: One of the most pessimistic views of the market is that of a Midwest jobber who avers he is willing to sell short on 99 out of 100 chemicals. In that area, the only product critically tight is by-product ammonium sulfate. There the steel strike has hit consumption of chemicals hard; moreover, coaltar chemicals inventories were being depleted when the steel settlement came. One happy

note is the good movement of citric and tartaric acids, vanillin and vegetable gums for summer drinks, ice cream.

On the West Coast, as well as in the Southwest, sales of agricultural chemicals have been disappointing. Prices, particularly on DDT, have been shaded, and one unit of a Texas insecticide plant has been closed because of poor demand. Among things tight in the Far West are mainly sebacic acid, azelaic acid, coconut oil (copra not coming in because of shipping strike), and in some spots, styrene, anhydrous ammonia and chlorinated solvents.

Chlorinated solvents are also off in the Southwest, where almost nothing is hard to get. There is some shading of price on caustic, phosphates and sulfuric acid by distributors, and some large orders of benzol, toluol and xylol have moved below the market, though that isn't expected to be repeated soon.

Around Pittsburgh, the report is that idle cokeovens have not had as pronounced effect as expected on coal-tar chemicals, except toluene. The reason: Consumption had decreased along with production—because of the strike. There has not been much trouble with containers.

Mixed Effects: In the East, basic chemicals are not hard to find either, and because of the steel strike, solvents, rust preventives, refractories, etc. had been falling off. Some imported phthalic anhydride reportedly has sold below domestic material, but domestic price is holding up. Chlorine is readily available, and like their fellow producers elsewhere, alkali companies find the caustic surplus their most pressing problem. But both benzene and phenol have been short.

While many may not be enthusiastic about the current status of the chemical market, they are not pessimistic about the future either. Most recognize that supply-and-demand balance is a condition they must get used to again, meet with increased sales effort. The consensus is that, given industrial peace, the rest of the year will see a pickup over the generally disappointing performance thus far.

Government Needs

Bid Closing	Invitation No.	Quantity	Item
Chicago Quartermaster Depot, Quartermaster Purchasing Division, Chicago, Ill.			
August 11	53-23B	2,981,000 lbs	Shortening compound canned (600 x 700 and 5 gallon can) spec. EE-S-321
Procurement Division Supply Service, Veterans Administration, Washington 25, D.C.			
August 4	A-15	7200 btl	Alcohol, dehydrated
August 5	A-16	552 btl	Benzene
August 5	A-16	2640 can	Barium sulfate
August 5	A-16	384 btl	Ammonium sulfate
August 5	A-16	1752 btl	Hydrochloric acid
August 5	A-16	768 btl	Hydriodic acid
August 5	A-16	384 btl	Homatrophine hydrobromide
August 5	A-16	2284 btl	Formaldehyde solution
August 5	A-16	7200 btl	Dextrose
August 5	A-16	252 btl	Codeine phosphate
August 5	A-16	168 btl	Capryl alcohol
August 5	A-16	288 btl	Butyl alcohol
General Services Administration, Business Service Center, Region 2, 250 Hudson St., N.Y. 13, N.Y.			
August 5	(NY-3B-39411)	146 can	Primer paint for galvanized or zinc surfaces

Government Awards

Item	Amount	Dollar Value	Supplier, Location
Commanding Officer, Fort McPherson, Fort McPherson, Ga.			
Wax, floor, water emulsion, fed. spec. P W 151A in 55 gal. drums	53,845 gal	28,236	Puritan Chemical Co., 916 Ashby N.W., Atlanta, Ga.
Procurement Division, San Francisco Port of Embarkation, Fort Mason, Calif.			
Compound, boiler, in approx. 1 lb. balls or briquettes	500,000 lbs	51,500	National Aluminate Corp., 6216 W. 66th Pl., Chicago 38, Ill.
Headquarters, Air Materiel Command, Dayton, O.			
Acid, phosphoric	303,840 lbs	51,921	Monsanto Chemical Co., 1700 South Second Street, St. Louis, Mo.
Photographic film		172,515	Ansco Div., General Aniline & Film Corp., Binghamton, N.Y.
Photographic film		30,370	Eastman Kodak Co., 343 State Street, Rochester, N.Y.
Cleaning compound	1,500,000 lbs	76,875	Wyandotte Chemical Corp., Wyandotte, Mich.
Acid, chromic	128,970 lbs	36,172	Fiber Chemical Corp., P.O. Box 218, Matawan, N.J.
Acid, sulfuric	223,540 lbs	39,566	Arthur S. LaPine & Co., 6001 South Knox Ave., Chicago, Ill.
Acid, hydrochloric	120,818 lbs	53,518	Cole Laboratories Inc., 42-25 9th Street, Long Island City, N.Y.
Acid, hydrofluoric	46,972 lbs		Cole Laboratories Inc., 42-25 9th Street, Long Island City, N.Y.
Aviation Supply Office, 700 Robbins Avenue, Philadelphia 11, Pa.			
Pigment	660,000 lbs	153,600	Titanium Pigment Corp., 111 Broadway, New York 6, N.Y.
Tricresyl phosphate	8,000 gal	28,400	Montrose Chemical Co., 120 Lister Ave., Newark 5, N.J.
Thinner	25,000 gal	25,090	Paint Specialties, Inc., 256 Napoleon St., San Francisco, Calif.

RESEARCH . . . .

No Need to Freeze

Firestone Tire & Rubber Co.'s five years of research, taking up where the Germans and other U. S. companies left off, has licked the problem of making "cold" rubber without cold.

Key chemical: Nitrazole CF (p-nitrobenzene diazonium p-chlorobenzene sulfonate). Product's name: Nitrazole rubber.

Chances are that no one will throw away the refrigerators. But a new rubber plant may well employ the new process.

There's no telling where a chemical compound will eventually turn up. Nitrazole CF, for example, is used as a dye intermediate; but now it turns out to be a polymerization catalyst that puts butadiene and styrene together "hot" (122 F) the same way the current process puts them together "cold" (41 F).

GR-S synthetic rubber used to be made at 122 F—indeed, almost half of it still is—but cold rubber has better abrasion resistance. Use of nitrazole, however, gives a comparable product at the old, higher temperature. Firestone has 2 million miles of fleet-testing to prove that point.

Import from Germany: While Firestone has nurtured the process to the point where it can stand on its own feet, it can't take credit for the initial discovery. It was tried first in Germany, but it never got out of the laboratory. U.S. firms tried it too, apparently didn't realize its full significance and dropped it as impractical.

That's where it was when researchers under Raymond Firestone, vice president in charge of research and development, took it up in December, 1947. While they were at work on the new process, cold rubber was put on a commercial scale (1948). The latter solved the abrasion problem, but only at the expense of refrigeration equipment to hold the temperature at 41 F. Now, simply by changing the catalyst, equivalent (but not superior) rubber can be made without refrigeration.

Stumblingblock: But all this doesn't mean that the government, which owns the synthetic rubber plants, will scrap the present process and switch to nitrazole rubber overnight. On the contrary, refrigeration equipment is on order for plants still making "hot" rubber. It's largely a matter of "bird in the hand" philosophy.

With the cold process thus firmly entrenched, Firestone sees little likelihood that the nitrazole process will be adopted for the time being.

Three possibilities, however, point to a gradual adoption:

RAYMOND FIRESTONE: Hot equals cold, and the cost is lower.

- As refrigeration equipment wears out, installation of the nitrazole process is more likely than replacement of freezing units.
- If new synthetic plants are built, nitrazole would be a logical choice.
- If the government sells present plants to private industry, the new operators may adopt the process to save on production cost.

Cheaper? Only one sizable batch (90,000 lbs.) of the new rubber has been made so far—for Firestone's and the government's test fleets. That's not enough to prove production economies, but savings seem obvious: the catalyst is no costlier than those presently used, capital outlay is lessened by the cost of refrigeration equipment, and operating cost is lessened by the expense of running such equipment.

Even though the government (i.e., the Reconstruction Finance Corp., which operates the rubber plants) has no plans to adopt the new method immediately, it's there for emergencies should refrigeration units fail, and it holds out the promise of a lower-cost product when rubber capacity is expanded.

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Calenders, New Rubber Calenders, 6x12", Johnson Joints, 7½ HP motor, Complete. Eagle Industries, 108 Washington St., NYC.

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Dryer, Vacuum Shelf, 20 shelves, 59 x 78, pump, cond. (6). Consolidated Products, 18 Park Row, N.Y. 38.

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Evaporators; Sextuple Eff. 58,200 sq. ft. First Machinery Corp., 157 Hudson St., N.Y. 13.

Filter Press, 18" x 18", Sperry, iron, P & F, 11 chambers. Consolidated Products, 18 Park Row, N.Y. 38.

Filter Press, 30"x30", iron, Sperry, steam heated, 30 chambers. Consolidated Products, 18 Park Row, N.Y. 38, N.Y., Barclay 7-0600.

Filter Press, 30" x 30", Aluminum, 45 Chambers. Consolidated Products, 18 Park Row, N.Y. 38.

Filter Press, 42" x 42", iron, Shriver, 18, 27, 36, 54 chambers (12). Consolidated Products, 18 Park Row, N.Y. 38.

Filter Presses, all sizes and types. Process Industries, 305 Powell St., Brooklyn 12, N.Y.

Filters, all sizes and types. Perry Equipment, 1415 N. 6th St., Phila. 22, Pa.

Granulator, Allis Chalmers, Ball, 4'6"x7', iron lined. Used 100 hours. Consolidated Products, 18 Park Row, New York 38, N.Y. BA 7-0600.

Kettles, S/S, 300 gal. and 200 gal., 100#, W. P. Consolidated Products, 18 Park Row, N.Y. 38.

Mill, New Rubber Mills, 6x12, 6x14, 6x16"; Johnson Joints, Complete. Eagle Industries, 108 Washington St., NYC.

Mills, Raymond #5047 & 5057, High Side Roller, (2). Consolidated Products, 18 Park Row, N.Y. 38.

Mills, Traylor tube, 5'x22', 5'x20', 4'6"x18'6", 4'x13', stone lined, pebble charge (4). Consolidated Products, 18 Park Row, New York 38, N.Y.

Mixer, Lab, BP Vacuum, 7½ gal. jktd, MD. Complete. Eagle Industries. 108 Washington St., NYC.

Mixer—SS vacuum, jktd, sigma arms, 5 gal. Equipment Clearing House, Inc. 289 - 10 St. Bklyn 15.

Mixers, 700 gal. Turbo, Simplex, jktd. (2). Consolidated Products, 18 Park Row, N.Y. 38.

Mixers, horiz. ribbon, 14'x7'6"x6', jktd. 450 cu. ft. (2) Consolidated Products, 18 Park Row, N.Y. 38.

Pebble Mills; 8'x8', Porcelain lined. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Pebble Mills 10 gal. to 800 gal., porcelain lined, 20. Consolidated Products, 18 Park Row, NY 38.

Reactors—New SS from 50 to 1000 gals. Equipment Clearing House, Inc., 289 10 St., Bklyn 15.

Reactors—Pfaudler 30 to 300 gallons. First Machinery Corp., 157 Hudson Street, N.Y. 3, N.Y.

Tablet Press, No. 5½, Colton 3" maximum. Consolidated Products, 18 Park Row, N.Y. 38.

Tanks, Alum, Pressure—330 and 480 gal. Perry Equipment, 1415 N. 6th St., Phila. 22, Pa.

Tanks, S/S, from 30 to 5700 Gal. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

Tanks, SS, from 180-10000 gal, jktd, storage, agtd. Eagle Industries, 108 Washington St., NYC.

Easier Patents

That swish toward the library might be the local contingent of chemical inventors and holders of chemical patents sprinting to look up what newly signed Public Law 593 means to them.

This new law, to which President Truman affixed his signature last week, has been characterized as "the finest codification and revision of the patent laws since the 1870's." It was known as the Bryson Bill when it first was introduced in Congress a little more than a year ago.

Among provisions of this law:

- A new use of a known compound, process or machine may be patented as a method.
- A patent owner gets two years (instead of one) to file for broader claims in a reissue application.
- A company or person, other than the inventor, may file an application if he can show some proprietary interest and if the inventor won't apply for the patent.

•

Glycerine Research: The Glycerine Producers' Association has established awards for "outstanding research in the application of glycerine or glycerine derivatives." The awards consist of a plaque and certificates, cash stipends of $1,000, $300 and $200.

Details and entry blanks are obtainable from the Association at 295 Madison Ave., New York, N. Y.

•

'Penta' Exonerated: Research both at Illinois and Tennessee Agriculture Experiment Stations shows that pentachlorophenol, widely used as a wood preservative, is harmless to livestock. Some chlorinated hydrocarbons—particularly naphthalene derivatives (*CW Newsletter, July 12*)—have been tagged responsible for X-disease (hyperkeratosis) in cattle, but force feeding of animals with pentachlorophenol solution demonstrated the compound's lack of toxicity.

•

Cell Research: Nucleoproteins, the mysterious substances that play a fundamental role in heredity, enzyme formation and cell metabolism in general, are the subject of a one-day symposium to be held at Laval University (Quebec City) Oct. 9. It is sponsored by the Chemical Institute of Canada.

MSA Supports Distaff Research

ALTHOUGH the Mutual Security Agency generally emphasizes the exchange of defense technology, its preoccupation with machine tools and armor plate didn't keep it from bringing Norway's Miss Inger Onshuus here to share U. S. scientific knowledge. She is working here with J. T. Baker's vice president and technical director, Joseph R. Stevens, with whom she has been assigned to do research during her 8-months' stay on the development of new antibiotics.

Miss Onshuus is ordinarily employed in the new medicine department of A/S Farmaceutisk Industri.

BOOKLETS . . . . . .

Chemicals

Caustic Soda

General information covering all phases of caustic soda. Some of the topics treated specifically are: manufacture, chemical and physical properties, methods of handling and storing. Dow Chemical Co., Midland, Mich.

Agilide

4-p. brochure on unplasticized polyvinyl chloride and its uses in corrosion-resistant equipment and products. Includes list of products and properties. American Agile Corp., P.O. Box 168, Bedford, O.

Styrene Monomer, Derivatives

39-p. booklet describing characteristics and uses for various styrene derivatives. Also contains illustrations and list of patent and literature references. Monsanto Chemical Co., St. Louis 4, Mo.

Shell Molding Process

28-p. manual on the shell molding process containing discussions of material requirements, necessary equipment, synopsis, and merits. Monsanto Chemical Co., Plastics Division, Springfield, Mass.

Dyeing Techniques

Manual entitled "Dyeing and Wet Finishing Techniques for Dynel" contains information on applying colors and finishes to new synthetic fiber. Includes sections on stock, package, and top dyeing. Textile Fibers Dept., Carbide and Carbon Chemicals Co., 30 E. 42 St., New York 17, N.Y.

Di-(2-Ethylhexyl) Adipate

2-p. technical service report on use of DOA as a primary plasticizer for vinyl resins. Uses and properties are listed. Write for report E-3, Witco Chemical Co., 295 Madison Ave., New York 17, N.Y.

Equipment

Combustion Indicators

4-p. brochure on visual smoke and combustion indicators contains drawings and suggested installation sketches. Of special interest to marine and industrial engineers. Ess Specialty Corp., 96 S. Washington Ave., Bergenfield, N.J.

Tachometer Heads

2-p. technical data sheet describes heavy duty measuring heads for measuring installations and speed under adverse conditions. No. 56M, Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.

Tube Heat Exchanger

19-p. booklet entitled "The G-R Twin G-Fin Section" discusses finned-tube heat exchanger with wide application for heating and cooling liquids and gases, and condensing vapors. No. 1400, Griscom-Russell Co., Dept. K, Massillon, O.

Liquid Agitators

16-p. brochure on processing vessels and liquid agitators contains outline of types, technical details, and illustrations. Struthers Wells Corp., Mixing Equipment Division, Warren, Pa.

Couplings

4-p. bulletin entitled "De Laval Crown Couplings" gives complete data on flexible couplings, including information on construction, horsepower ratings, speeds, applications, and selection. De Laval Steam Turbine Co., Trenton 2, N.J.

Elevating Table

2-p. bulletin describing Raymond Corp.'s standard hydraulic elevating tables. Features of the product are outlined, and illustrations show the adaptability of the equipment. Write for Bulletin 232, The Raymond Corp., 5593 Madison St., Greene, N.Y.

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